MH70-HD0
MH70-HD1

Dual LGA2011 sockets R3 motherboard for Intel® E5-2600 V3/V4 series processors

User's Manual

Rev. 1001

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Documentation Classifications

In order to assist in the use of this product, GIGABYTE provides the following types of documentations:

- For detailed product information, carefully read the User's Manual.

For product-related information, check on our website at:
http://www.gigabyte.com

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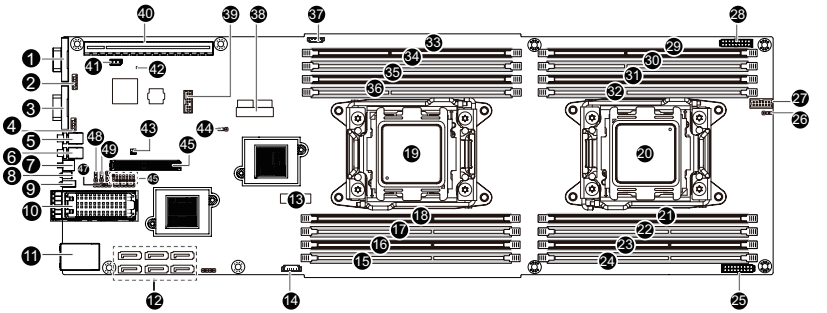
Box Contents

☑ Motherboard

- The box contents above are for reference only and the actual items shall depend on the product package you obtain. The box contents are subject to change without notice.
- The motherboard image is for reference only.

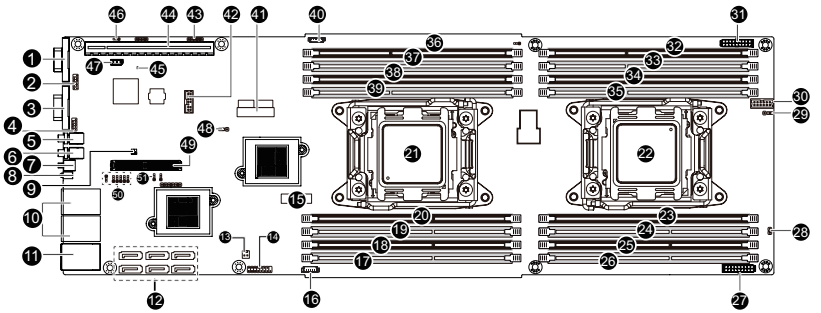
MH70-HD0 Motherboard Layout



Item	Code	Description
1	VGA_1	Rear VGA port
2	F_VGA1	Front VGA header
3	COM1	Rear serial port
4	COM2	Front serial port header
5	SW_PWR1	Power button/LED
6	SW_ID	ID switch button
7	SW_RST_NMI	Reset button (top)/NMI button (buttom)
8	LED_STA	System status LED
9	LED_LAN	LAN1 (buttom)/LAN2 (top) Active/Link LEDs
10	QSFP_1	QSFP LAN port
11	USB3_LAN1	BMC management LAN port (top)/USB 3.0 ports (buttom)
12	SATA0/SATA1/SATA2/SATA3/ SATA4/SATA5	SATA 6Gb/s connectors
13	BAT1	Battery socket
14	SATA_SGP1	SATA SGPIO header
15	DIMM_P0_A0	Channel 1 slot 0 (for primary CPU)
16	DIMM_P0_A1	Channel 1 slot 1 (for primary CPU)
17	DIMM_P0_B0	Channel 2 slot 0 (for primary CPU)
18	DIMM_P0_B1	Channel 2 slot 1 (for primary CPU)
19	CPU0	Intel LGA2011 Socket R (Primary CPU)
20	CPU1	Intel LGA2011 Socket R (Secondary CPU)
21	DIMM_P1_H1	Channel 4 slot 1 (for secondary CPU)
22	DIMM_P1_H0	Channel 4 slot 0 (for secondary CPU)
23	DIMM_P1_G1	Channel 3 slot 1 (for secondary CPU)
24	DIMM_P1_G0	Channel 3 slot 0 (for secondary CPU)
25	SSI_2X9P1	18 pin power connector
26	ACK_SEL	4 Nodes System and Rack System switch jumper

27	FP_1	Front panel header
28	SSI_2X9P2	18 pin power connector
29	DIMM_P1_E0	Channel 1 slot 0 (for secondary CPU)
30	DIMM_P1_E1	Channel 1 slot 1 (for secondary CPU)
31	DIMM_P1_F0	Channel 2 slot 0 (for secondary CPU)
32	DIMM_P1_F1	Channel 2 slot 1 (for secondary CPU)
33	DIMM_P0_C0	Channel 3 slot 0 (for primary CPU)
34	DIMM_P0_C1	Channel 3 slot 1 (for primary CPU)
35	DIMM_P0_D0	Channel 4 slot 0 (for primary CPU)
36	DIMM_P0_D1	Channel 4 slot 1 (for primary CPU)
37	BMC_SGPIO1	BMC SGPIO header
38	F_USB3	USB 3.0 header
39	TPM	TPM module connector
40	PCIE_1	PCI-E slot 1 (x16 slot/Running at x16)
41	IPMB	IPMB connector
42	LED_BMC	BMC firmware readiness LED
43	SW_RAID	Software RAID Key jumper
44	CLR_CMOS	Clear CMOS jumper
45	MEZZ_1	PCI-E x8 slot (for Mezzanine card/Proprietary slot/ Running at x8)
46	ME_UPDATE	ME update jumper
	BIOS_PWD	Clearing Supervisor Password jumper
	BIOS_RCVR	BIOS recovery jumper
	BIOS_WP	BIOS write protect jumper
	ME_RCVR	ME recovry jumper
	S3_MASK	S3 Power On Select jumper
47	PMBUS	PMBus header
48	PMBUS_SEL	PMbus select jumper
49	BMC_FRB	Force to Stop FRB Timer jumper

MH70-HD1 Motherboard Layout



Item	Code	Description
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8	LED_STA	System status LED
9	SW_RAID	Software RAID Key jumper
10	LAN1/LAN2	LAN ports
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12	SATA0/SATA1/SATA2/SATA3/ SATA4/SATA5	SATA 6Gb/s connectors
13	SATA_POWER	SATA Power connector
14	F_MLAN	F_MLAN header
15	BAT1	Battery socket
16	SATA_SGP1	SATA SGPIO header
17	DIMM_P0_A0	Channel 1 slot 0 (for primary CPU)
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19	DIMM_P0_B0	Channel 2 slot 0 (for primary CPU)
20	DIMM_P0_B1	Channel 2 slot 1 (for primary CPU)
21	CPU0	Intel LGA2011 Socket R (Primary CPU)
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23	DIMM_P1_H1	Channel 4 slot 1 (for secondary CPU)
24	DIMM_P1_H0	Channel 4 slot 0 (for secondary CPU)
25	DIMM_P1_G1	Channel 3 slot 1 (for secondary CPU)
26	DIMM_P1_G0	Channel 3 slot 0 (for secondary CPU)
27	SSI_2X9P1	18 pin power connector
28	BMC_RST	BMC reset header (Reserved)
29	ACK_SEL	4 Nodes System and Rack System switch jumper

30	FP_1	Front panel header
31	SSI_2X9P2	18 pin power connector
32	DIMM_P1_E0	Channel 1 slot 0 (for secondary CPU)
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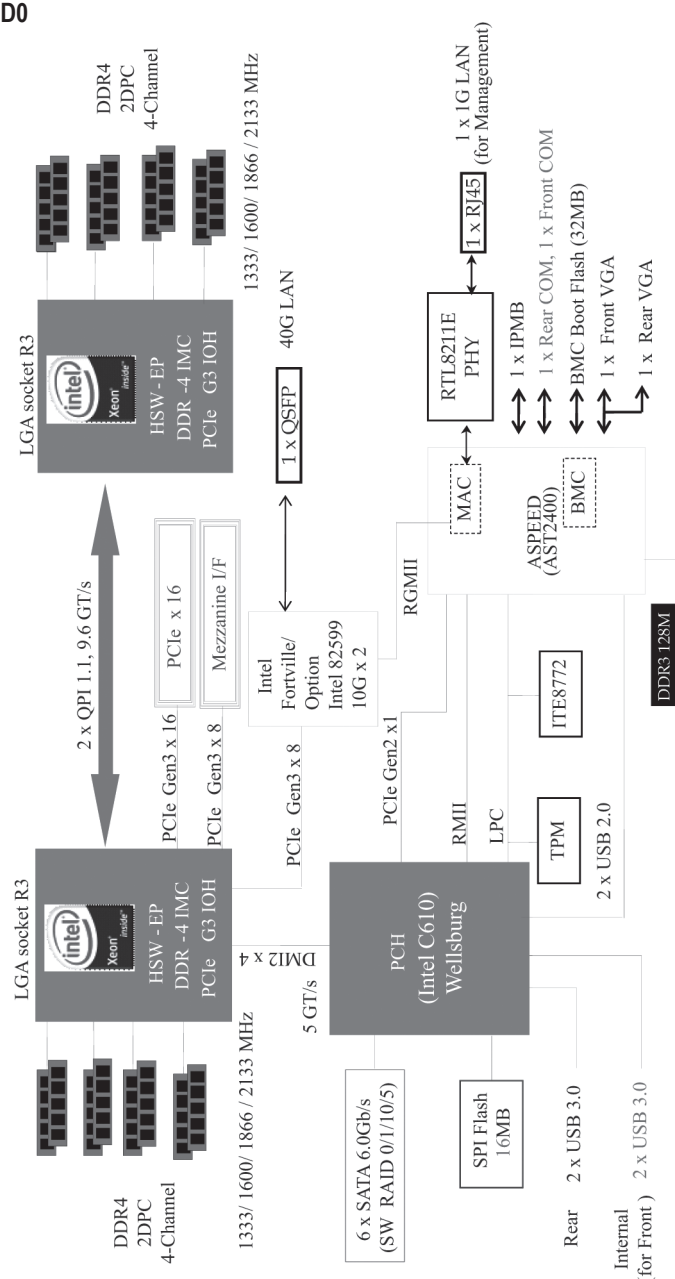
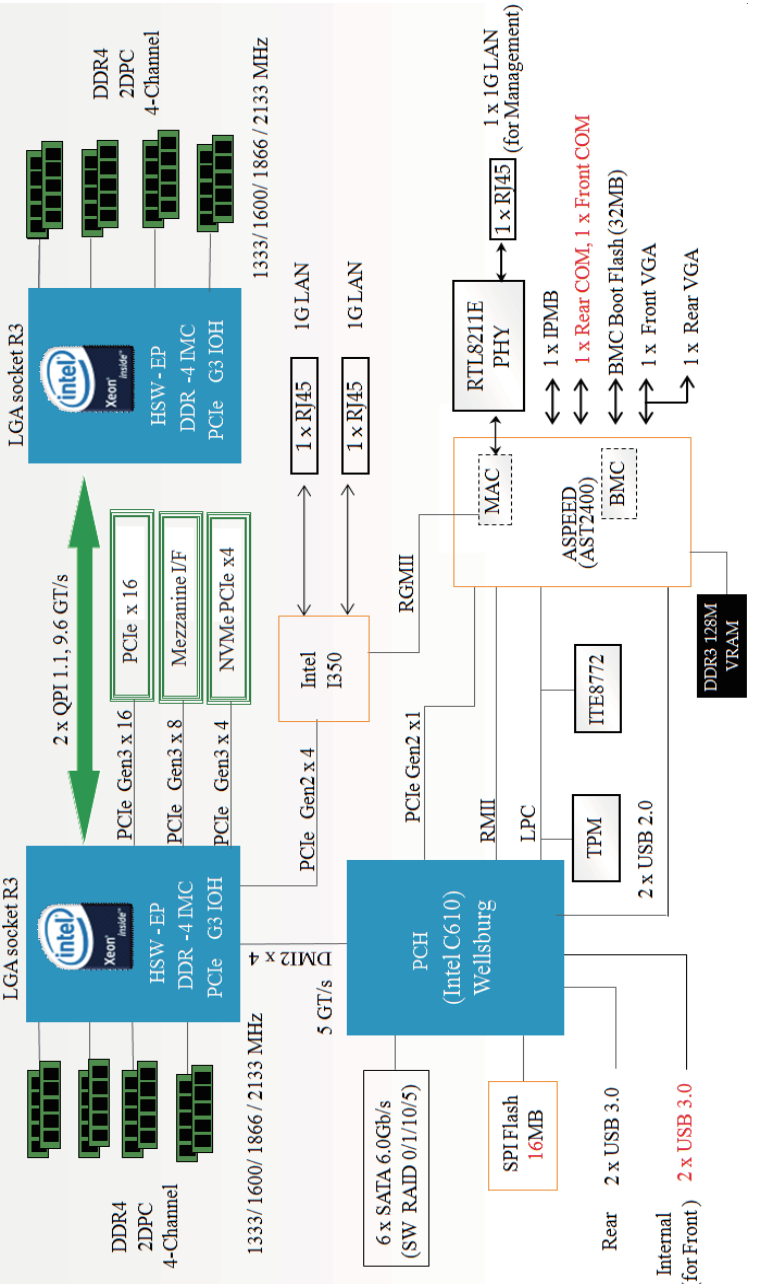
46	SMB_SEL	SMBus Select jumper
47	IPMB	IPMB connector
48	CLR_CMOS	Clear CMOS jumper
49	MEZZ_1	PCI-E x8 slot (for Mezzanine card/Proprietary slot/ Running at x8)
50	S3_MASK	S3 Power On Select jumper
	BIOS_WP	BIOS write protect jumper
	BIOS_RCVR	BIOS recovery jumper
	BIOS_PWD	Clearing Supervisor Password
	ME_UPDATE	ME update jumper
51	PMBUS_SEL	PMBus select jumper

Block Diagram

MH70-HD0




LGA socket R3
HSW - EP
DDR -4 IMC
PCIe G3 IOH
2 x QPI 1.1, 9.6 GT/s
PCIe Gen3 x 16
PCIe x 16
PCIe Gen3 x 8
Mezzanine I/F
PCIe Gen3 x 4
NVMe PCIe x4
DDR4
2DPC
4-Channel
1333/ 1600/ 1866 / 2133 MHz
PCIe Gen2 x 4
Intel
I350
1 x RJ45
1G LAN
RGMII
DMI2 x 4
5 GT/s
PCH
(Intel C610)
Wellsburg
PCIe Gen2 x1
RMII
LPC
MAC
RTL8211E
PHY
1 x RJ45
1 x 1G LAN
(for Management)
1 x IPMB
1 x Rear COM, 1 x Front COM
BMC Boot Flash (32MB)
1 x Front VGA
1 x Rear VGA
ASPEED
(AST2400)
BMC
DDR3 128M
VRAM
TPM
ITE8772
2 x USB 2.0
6 x SATA 6.0Gb/s
(SW RAID 0/1/10/5)
SPI Flash
16MB
Rear 2 x USB 3.0
Internal
(for Front) 2 x USB 3.0

Chapter 1 Hardware Installation

1-1 Installation Precautions

The motherboard contains numerous delicate electronic circuits and components which can become damaged as a result of electrostatic discharge (ESD). Prior to installation, carefully read the user's manual and follow these procedures:

- Prior to installation, do not remove or break motherboard S/N (Serial Number) sticker or warranty sticker provided by your dealer. These stickers are required for warranty validation.
- Always remove the AC power by unplugging the power cord from the power outlet before installing or removing the motherboard or other hardware components.
- When connecting hardware components to the internal connectors on the motherboard, make sure they are connected tightly and securely.
- When handling the motherboard, avoid touching any metal leads or connectors.
- It is best to wear an electrostatic discharge (ESD) wrist strap when handling electronic components such as a motherboard, CPU or memory. If you do not have an ESD wrist strap, keep your hands dry and first touch a metal object to eliminate static electricity.
- Prior to installing the motherboard, please have it on top of an antistatic pad or within an electrostatic shielding container.
- Before unplugging the power supply cable from the motherboard, make sure the power supply has been turned off.
- Before turning on the power, make sure the power supply voltage has been set according to the local voltage standard.
- Before using the product, please verify that all cables and power connectors of your hardware components are connected.
- To prevent damage to the motherboard, do not allow screws to come in contact with the motherboard circuit or its components.
- Make sure there are no leftover screws or metal components placed on the motherboard or within the computer casing.
- Do not place the computer system on an uneven surface.
- Do not place the computer system in a high-temperature environment.
- Turning on the computer power during the installation process can lead to damage to system components as well as physical harm to the user.
- If you are uncertain about any installation steps or have a problem related to the use of the product, please consult a certified computer technician.

1-2 Product Specifications

CPU	◆ Support for Intel® Xeon® E5-2600 V3/V4 series processors in the LGA2011 package ◆ L3 cache varies with CPU ◆ Supports Dual QuickPath Interconnect up to 9.6GT/s ◆ Enhanced Intel SpeedStep Technology (EIST) ◆ Support Intel Virtualization Technology (VT)
Chipset	◆ Intel® C612 Express (Wellsburg) Chipset
Memory	◆ 16 x DIMM slots ◆ DDR4 memory supported only ◆ Quad channel memory architecture ◆ ECC RDIMM / LRDIMM modules supported ◆ Single and dual rank RDIMM modules up to 32GB supported ◆ 3DS LRDIMM modules up to 128GB supported ◆ 1.2V modules: 1600/1866/2133/2400 MHz
LAN	◆ Intel® 82599ES 10GbE LAN controller with QSFP+ (MH70-HD0 Only) ◆ Option Intel® Fortville 40GbE LAN controller with QSFP+ (MH70-HD0 Only) ◆ Intel® I350 GbE LAN controller (MH70-HD1 Only) ◆ Realtek RTL8211E supports server management LAN port
Expansion Slots	◆ 1 x PCI Express x16 slot, running at x16 (Gen3) ◆ 1 x Mezzanine Card, running at x8 (Gen3)
Onboard Graphics	◆ ASPEED® AST2400 supports 16MB DDR3 VRAM
Storage Interface	◆ Intel® C612 Express controller ◆ 6 x SATA3 6Gb/s connectors ◆ Support for Intel RSTe 4.0 with SATA RAID 0, RAID 1, 10, 5
USB	◆ Up to 4 USB 3.0 ports (2 on the back panel, 2 additional ports via the USB brackets connected to the internal USB headers)
Internal Connectors	◆ 2 x 18-pin power connectors ◆ 1 x Front panel header ◆ 6 x SATA3 6Gb/s connectors ◆ 1 x USB 3.0 header ◆ 1 x TPM module connector ◆ 1 x SATA SPGIO header ◆ 1 x BMC SPGIO header ◆ 1 x PMBUS header ◆ 1 x IPMB connector ◆ 1 x Software RAID key connector ◆ 1 x Serial port header ◆ 1 x VGA port header

Rear Panel I/O	◆	2 x USB 2.0/3.0 ports ◆ 1 x 10/100/1000 Management LAN port ◆ 2 x RJ-45 ports (MH70-HD1 Only) ◆ 1 x QSFP+ LAN port (MH70-HD0 Only) ◆ 1 x Serial port ◆ 1 x VGA port ◆ 1 x Power switch button/status LED ◆ 1 x ID switch button/LED ◆ 1 x Reset button ◆ 1 x NMI button ◆ 1 x System status LED ◆ 2 x LAN Link/Active LED (LAN1/LAN2)
I/O Controller	◆	ASPEED® AST2400 BMC chip
Hardware Monitor	◆	System voltage detection ◆ CPU/System temperature detection ◆ CPU/System fan speed detection ◆ CPU/System fan speed control * Whether the CPU/system fan speed control function is supported will depend on the CPU/system cooler you install.
BIOS	◆	1 x 128 Mbit flash ◆ AMI BIOS
Form Factor	◆	Propriety Form Factor; 6.5" x 19.4", 10 layers PCB

* GIGABYTE reserves the right to make any changes to the product specifications and product-related information without prior notice.

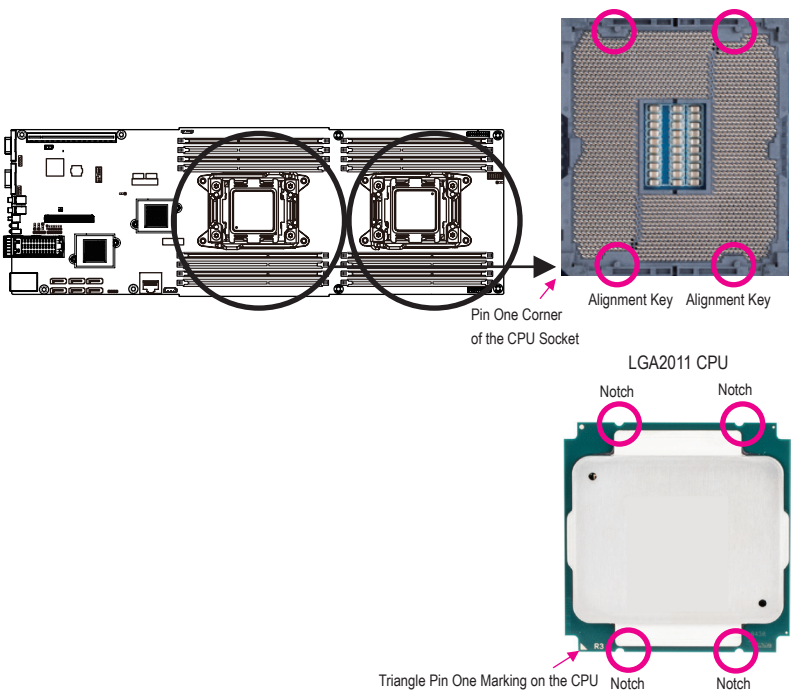
1-3 Installing the CPU and CPU Cooler

Read the following guidelines before you begin to install the CPU:

- Make sure that the motherboard supports the CPU.
- Always turn off the computer and unplug the power cord from the power outlet before installing the CPU to prevent hardware damage.
- Locate the pin one of the CPU. The CPU cannot be inserted if oriented incorrectly. (Or you may locate the notches on both sides of the CPU and alignment keys on the CPU socket.)
- Apply an even and thin layer of thermal grease on the surface of the CPU.
- Do not turn on the computer if the CPU cooler is not installed, otherwise overheating and damage of the CPU may occur.
- Set the CPU host frequency in accordance with the CPU specifications. It is not recommended that the system bus frequency be set beyond hardware specifications since it does not meet the standard requirements for the peripherals. If you wish to set the frequency beyond the standard specifications, please do so according to your hardware specifications including the CPU, graphics card, memory, hard drive, etc.

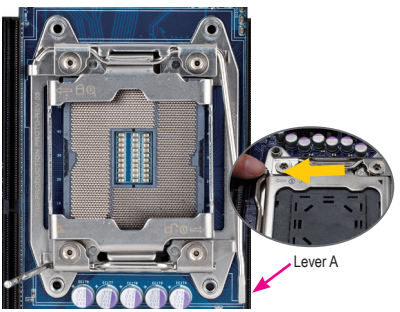
1-3-1 Installing the CPU

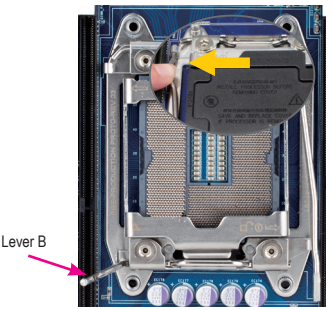
A. Locate the alignment keys on the motherboard CPU socket and the notches on the CPU.



B. Follow the steps below to correctly install the CPU into the motherboard CPU socket.

- **Before installing the CPU, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the CPU.**
- **To protect the socket contacts, do not remove the protective plastic cover unless the CPU is inserted into the CPU socket. Save the cover properly and replace it if the CPU is removed.**



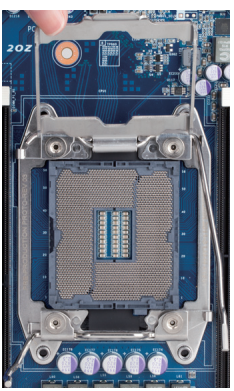


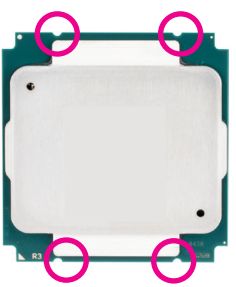
Step 1:

Push the lever closest to the "unlock" marking "" (below referred as lever A) down and away from the socket to release it.

Step 2:

Push the lever closest to the "lock" marking "" (below referred as lever B) down and away from the socket. Then lift the lever.



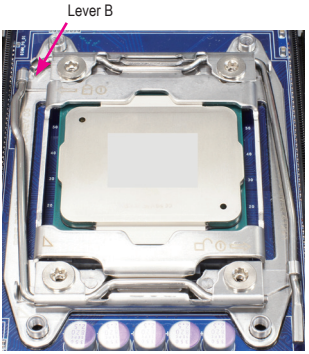


Step 3:

Gently press lever A to allow the load plate to rise. Open the load plate. (Note: DO NOT touch the socket contacts after the load plate is opened.)

Step 4:

Hold the CPU with your thumb and index fingers. Align the CPU pin one marking (triangle) with the pin one corner of the CPU socket (or align the CPU notches with the socket alignment keys) and carefully insert the CPU into the socket vertically.



Step 5:

Once the CPU is properly inserted, carefully replace the load plate. Then secure lever B under its retention tab. The protective plastic cover may pop off from the load plate during the process of engaging the lever. Remove the cover. Save the cover properly and always replace it when the CPU is not installed.

Step 6:

Finally, secure lever A under its retention tab to complete the installation of the CPU.

1-4 Installing the Memory

Read the following guidelines before you begin to install the memory:

- Make sure that the motherboard supports the memory. It is recommended that memory of the same capacity, brand, speed, and chips be used.
- Always turn off the computer and unplug the power cord from the power outlet before installing the memory to prevent hardware damage.
- Memory modules have a foolproof design. A memory module can be installed in only one direction. If you are unable to insert the memory, switch the direction.

1-4-1 Four Channel Memory Configuration

This motherboard provides sixteen DDR4 memory sockets and supports Four Channel Technology. After the memory is installed, the BIOS will automatically detect the specifications and capacity of the memory. Enabling Four Channel memory mode will be four times of the original memory bandwidth.

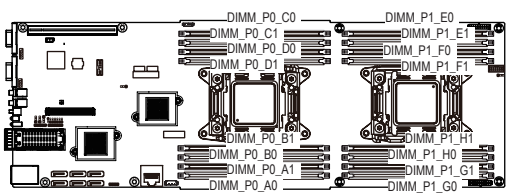
The four DDR4 memory sockets are divided into four channels each channel has two memory sockets as following:

Channel 1: DIMM_P0_A0/DIMM_P0_A1 (For pimary CPU)/
DIMM_P1_E0/DIMM_P1_E1 (For secondary CPU)

Channel 2: DIMM_P0_B0/DIMM_P0_B1 (For pimary CPU)
DIMM_P1_F0/DIMM_P1_F1 (For secondary CPU)

Channel 3: DIMM_P0_C0/DIMM_P0_C1 (For pimary CPU)
DIMM_P1_G0/DIMM_P1_G1 (For secondary CPU)

Channel 4: DIMM_P0_D0/DIMM_P0_D1 (For pimary CPU)
DIMM_P1_H0/DIMM_P1_H1 (For secondary CPU)



Due to CPU limitations, read the following guidelines before installing the memory in Four Channel mode.

1. Four Channel mode cannot be enabled if only one DDR4 memory module is installed.
2. When enabling Four Channel mode with two or four memory modules, it is recommended that memory of the same capacity, brand, speed, and chips be used for optimum performance.

1-4-2 Installing a Memory

Before installing a memory module, make sure to turn off the computer and unplug the power cord from the power outlet to prevent damage to the memory module.

Be sure to install DDR3 DIMMs on this motherboard.

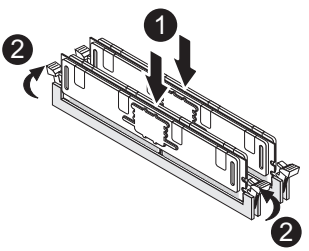
Installation Step:

Step 1. Insert the DIMM memory module vertically into the DIMM slot, and push it down.

Step 2. Close the plastic clip at both edges of the DIMM slots to lock the DIMM module.

Note: For dual-channel operation, DIMMs must be installed in matched pairs.

Step 3. Reverse the installation steps when you wish to remove the DIMM module.



1-4-3 DIMM Population Table

Two Slots Channel RDIMM Population Configuration Within a Channel

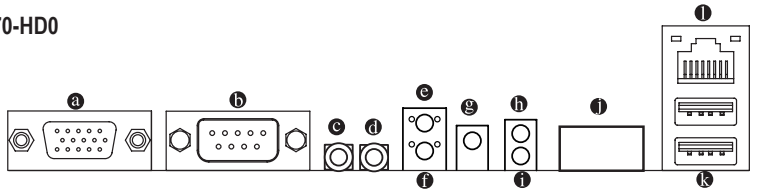
Type	Ranks Per DIMM and Data Width	Speed (MT/s); Slot Per Channel (SPC) and DIMM Per Channel (DPC)		
		1 Slot Per Channel	2 Slot Per Channel	
		1DPC	1DPC	2DPC
RDIMM	SRx4	2133	2133	1866
RDIMM	SRx8	2133	2133	1866
RDIMM	DRx8	2133	2133	1866
RDIMM	DRx4	2133	2133	1866
LRDIMM	QRx4	2133	2133	2133
LRDIMM 3DS	8Rx4	2400	2400	2400

NOTE!

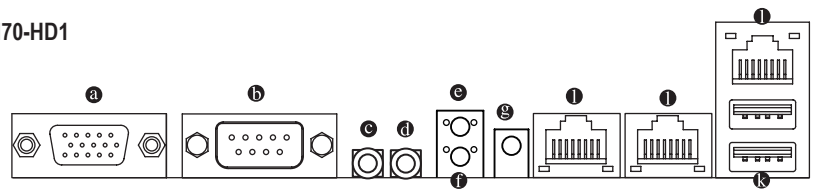
DDR4 2400MHz is only available on Intel Xeon® E5-2600 V4 processor.

1-5 Back Panel Connectors

MH70-HD0



MH70-HD1



a Serial Port

Connects to serial-based mouse or data processing devices.

b Video Port

The video in port allows connect to video in, which can also apply to video loop thru function.

c Power Button and LED

Press this button to hard reset and power on the system.

Color	Status	Description
Green	On	System is powered on.
N/A	Off	• System is not powered on or in ACPI S5 state (power off) • System is in ACPI S4 state (hibernate mode)

d ID Button and LED

This button provides the selected unit idfication function.

Color	Status	Description
Blue	On	Unit selected for identification.
N/A	Off	No identification.

e Reset Button

Press this button to reset the system.

f NMI Button

The NMI button allows a technician servicing the server to generate a NMI to the processor to help solve server errors.

ⓖ System Status LED

Color	Status	Description
Green	On	System is operating normally.
	Blink	Degrade condition, may indicates the following: • CPU failure • DIMM killed
Amber	On	Critical condition, may indicates the following: • Power module failure • System fan failure • Power supply voltage issue • System temperature/voltage issue
	Blink	Non-critical condition, may indicates the following: • Redundant power module failure • Temperature and voltage issue • Chassis intrusion
N/A	Off	System is not ready. May indicate the following: • POST error • NMI error • Processor or terminator missing

ⓗ LAN2 Active/Link LED (MH70-HD0 Only)

Color	Status	Description
Green	On	Link between system and network or no access
	Blink	Data transmission or receiving is occurring
N/A	Off	No data transmission or receiving is occurring

ⓘ LAN1 Active/Link LED

Color	Status	Description
Green	On	Link between system and network or no access
	Blink	Data transmission or receiving is occurring
N/A	Off	No data transmission or receiving is occurring

ⓙ QSFP LAN Port (MH70-HD0 Only)

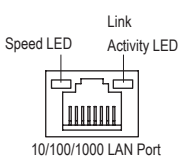
The QSFP LAN port provides Internet connection at up to 10 Gbps data rate. The following describes the states of the LAN port LEDs.

ⓚ USB 3.0 Port

The USB port supports the USB 3.0 specification. Use this port for USB devices such as a USB keyboard/mouse, USB printer, USB flash drive and etc.

ⓛ RJ-45 LAN Port (1 Gigabit Ethernet LAN Port)

The Gigabit Ethernet LAN port provides Internet connection at up to 1 Gbps data rate. The following describes the states of the LAN port LEDs.

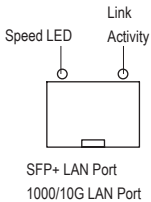


Speed LED:

State	Description
Yellow On	1 Gbps data rate
Yellow Blink	Identify 1 Gbps data rate
Green On	100 Mbps data rate
Green Blink	Identify 100 Mbps data rate
Off	10 Mbps data rate

Link/Activity LED:

State	Description
On	Link between system and network or no access
Blinking	Data transmission or receiving is occurring
Off	No data transmission or receiving is occurring



SFP+ Speed LED:

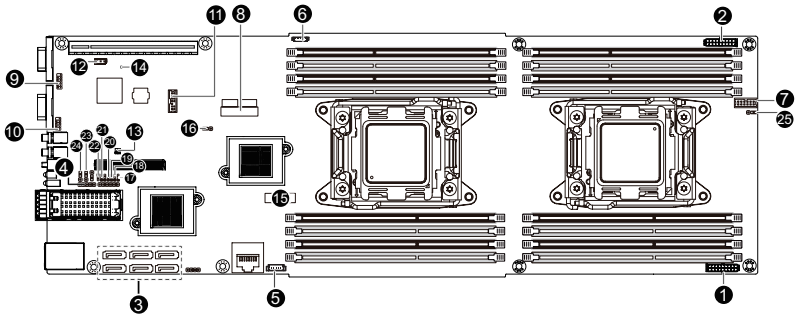
State	Description
Green On	10 Gbps data rate
Green Blink	Identify 10 Gbps data rate
Yellow On	1 Gbps data rate
Yellow Blink	Identify 1 Gbps data rate
Off	100 Mbps data rate

Link/Activity LED:

State	Description
On	Link between system and network or no access
Blinking	Data transmission or receiving is occurring
Off	No data transmission or receiving is occurring

- When removing the cable connected to a back panel connector, first remove the cable from your device and then remove it from the motherboard.
- When removing the cable, pull it straight out from the connector. Do not rock it side to side to prevent an electrical short inside the cable connector.

1-6 Internal Connectors and Jumper Settings



1)	SSI_2X9P1	14)	LED_BMC
2)	SSI_2X9P2	15)	BAT1
3)	SATA0/1/2/3/4/5	16)	CLR_CMOS
4)	PMBUS	17)	ME_UPDATE
5)	SATA_SGP1	18)	BIOS_PWD
6)	BMC_SGPIO1	19)	BIOS_RCVR
7)	FP_1	20)	BIOS_WP
8)	F_USB3	21)	ME_RCVR
9)	F_VGA1	22)	S3_MASK
10)	COM2	23)	BMC_FRB
11)	TPM	24)	PMBUS_SEL
12)	IPMB	25)	ACK_SEL
13)	SW_RAID		

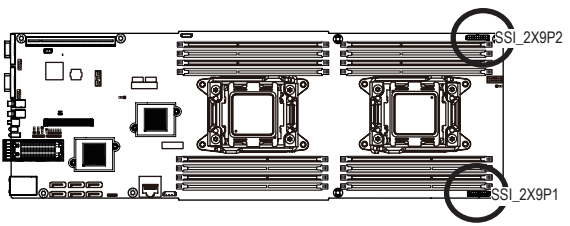
Read the following guidelines before connecting external devices:

- First make sure your devices are compliant with the connectors you wish to connect.
- Before installing the devices, be sure to turn off the devices and your computer. Unplug the power cord from the power outlet to prevent damage to the devices.
- After installing the device and before turning on the computer, make sure the device cable has been securely attached to the connector on the motherboard.

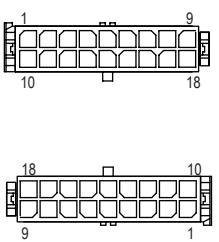
1/2/3) SSI_2X9P1/SSI_2X9P2 (2x9 Power Connectors)

With the use of the power connector, the power supply can supply enough stable power to all the components on the motherboard. Before connecting the power connector, first make sure the power supply is turned off and all devices are properly installed. The power connector possesses a foolproof design. Connect the power supply cable to the power connector in the correct orientation.

- **To meet expansion requirements, it is recommended that a power supply that can withstand high power consumption be used (500W or greater). If a power supply is used that does not provide the required power, the result can lead to an unstable or unbootable system.**



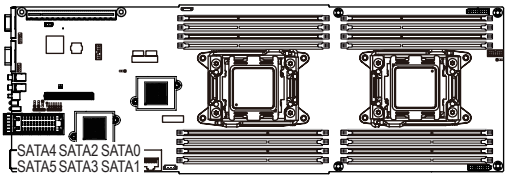
SSI_2X9P

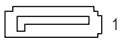


Pin No.	Definition	Pin No.	Definition
1	GND	10	12V_STBY
2	GND	11	12V
3	GND	12	12V
4	GND	13	12V
5	GND	14	12V
6	GND	15	12V
7	GND	16	12V
8	GND	17	12V
9	GND	18	12V

3) SATA0/SATA1/SATA2/SATA3/SATA4/SATA5 (SATA 6Gb/s Connectors

The SATA connectors conform to SATA 6Gb/s standard and are compatible with SATA 3Gb/s and 1.5Gb/s standard. Each SATA connector supports a single SATA device.



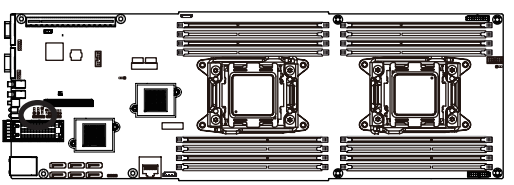


Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND

- A RAID 0 or RAID 1 configuration requires at least two hard drives. If more than two hard drives are configured, the total number of hard drives must be an even number.
- A RAID 10 configuration requires four hard drives.

(Note) When a RAID configuration is built across the SATA 6Gb/s channels, the system performance of the RAID configuration may vary depends on the devices are connected.

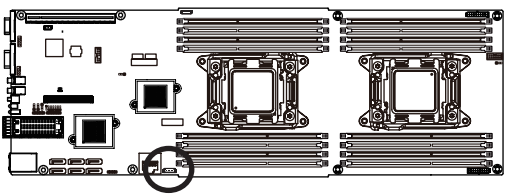
4) PMBUS (PMBus connector)



Pin No.	Definition
1	PMBus CLK
2	PMBus DATA
3	PMBus Alert
4	GND
5	3.3V Sense

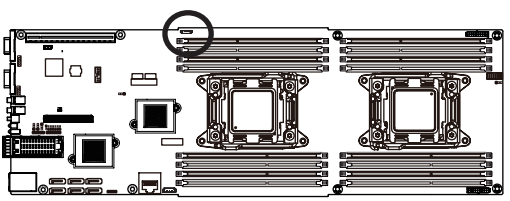
5) SATA_SGP1 (SATA SGPIO Header)

SGPIO stands for Serial General Purpose Input/Output which is a 4-signal (or 4-wire) bus used between a Host Bus Adapter (HBA) and a backplane. Out of the 4 signals, 3 are driven by the HBA and 1 is driven by the backplane. Typically, the HBA is a storage controller located inside a server, desktop, rack or workstation computer that interfaces with Hard disk drives (HDDs) to store and retrieve data.



Pin No.	Definition
1	SDOUT
2	GND
3	SDIN
4	SLOAD
5	SCLK

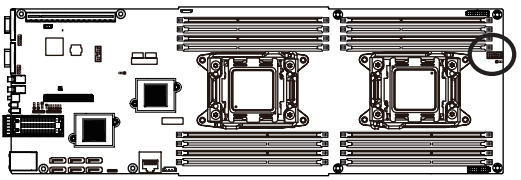
6) BMC_SGPIO1 (BMC SGPIO Header)

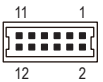


Pin No.	Definition
1	SDIN
2	GND
3	SDOUT
4	GND
5	SLOAD
6	GND
7	SCLK

7) FP_1 (Front Panel Header)

Connect the power switch, reset switch, chassis intrusion switch/sensor and system status indicator on the chassis to this header according to the pin assignments below. Note the positive and negative pins before connecting the cables.

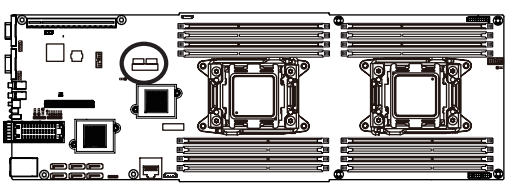


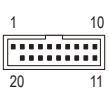


Pin No.	Definition
1	PS_ON_N
2	I2C_FCB_SCL
3	PSU_PWRGD
4	I2C_FCB_SDA
5	BMC_FCB_N
6	STATUS_GREEN_N
7	FP_PWR_BTN_N
8	STATUS_AMBER_N
9	ACK_BMC_N
10	BMC_UID_LED_N
11	GND
12	BMC_UID_BUTTON_TTL_N

8) F_USB3 (USB 3.0 Header)

The headers conform to USB 3.0 specification. Each USB header can provide two USB ports via an optional USB bracket. For purchasing the optional USB bracket, please contact the local dealer.

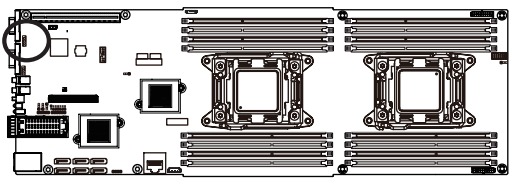




Pin No.	Definition	Pin No.	Definition
1	Power	11	IntA_P2_D+
2	IntA_P1_SSRX-	12	IntA_P2_D-
3	IntA_P1_SSRX+	13	GND
4	GND	14	IntA_P2_SSTX+
5	IntA_P1_SSTX-	15	IntA_P2_SSTX-
6	IntA_P1_SSTX+	16	GND
7	GND	17	IntA_P2_SSRX+
8	IntA_P1_D-	18	IntA_P2_SSRX-
9	IntA_P1_D+	19	Power
10	NC	20	No Pin

9) F_VGA1 (Front VGA Header)

The Front VGA header provides switch function between front VGA and rear VGA. When the front VGA is enabled, the rear VGA function will be disabled.

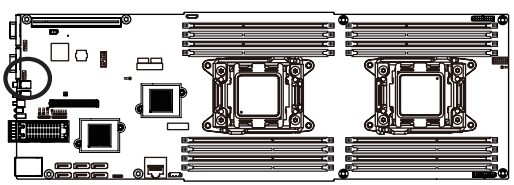


Pin No.	Definition
1	VGA_FP_VS
2	VGA_FP_HS
3	VGA_FP_PWR
4	VGA_FP_DDC_CLK
5	FP_N
6	VGA_FP_DDC_DAT
7	VGA_FP_B
8	GND
9	VGA_FP_G
10	GND
11	VGA_FP_R
12	No Pin

	Active Status	Display
FP_N	H	Rear VGA
	L	Front VGA

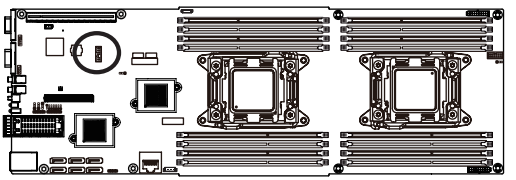
10) COM2 (Serial Port Header)

The COM header provides one serial port via an optional COM port cable. For purchasing the optional COM port cable, please contact the local dealer.



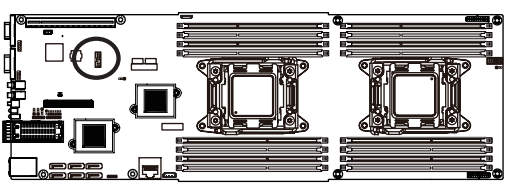
Pin No.	Definition
1	NDCDB
2	NSINB
3	NSOUTB
4	NDTRB_N
5	GND
6	NDSRB_N
7	NRTSB_N
8	NCTSB_N
9	NRIB_N
10	No Pin

11) TPM (TPM Module Connector)



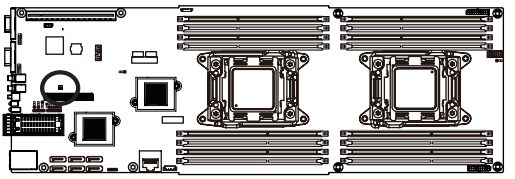
Pin No.	Definition
1	CLK_33M_TPM
2	P_3V3_AUX
3	LPC_RST
4	P3V3
5	LPC_LAD0
6	IRQ_SERIAL
7	LPC_LAD1
8	NC
9	LPC_LAD2
10	No Pin
11	LPC_LAD3
12	GND
13	LPC_FRAME_N
14	GND

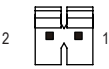
12) IPMB (IPMB Connector)



Pin No.	Definition
1	Clock
2	GND
3	Data

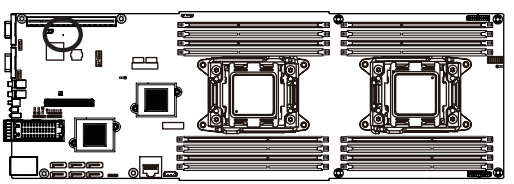
13) SW_RAID (Intel RAID Key Header)





Pin No.	Definition
1	KEY
2	GND

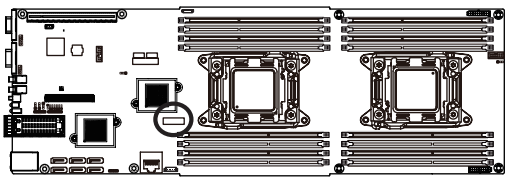
14) LED_BMC (BMC Firmware Readiness LED)

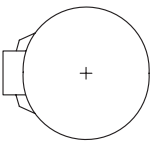


State	Description
On	BMC firmware is initial
Blinking	BMC firmware is ready
Off	AC loss

15) BAT1 (Battery Socket)

The battery provides power to keep the values (such as BIOS configurations, date, and time information) in the CMOS when the computer is turned off. Replace the battery when the battery voltage drops to a low level, or the CMOS values may not be accurate or may be lost.

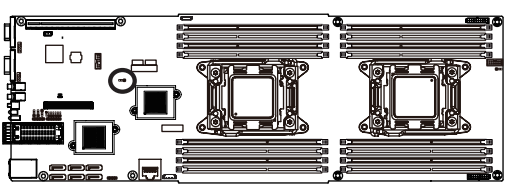




- Always turn off your computer and unplug the power cord before replacing the battery.
- Replace the battery with an equivalent one. Danger of explosion if the battery is replaced with an incorrect model.
- Contact the place of purchase or local dealer if you are not able to replace the battery by yourself or uncertain about the battery model.
- When installing the battery, note the orientation of the positive side (+) and the negative side (-) of the battery (the positive side should face up).
- Used batteries must be handled in accordance with local environmental regulations.

16) CLR_CMOS (Clearing CMOS Jumper)

Use this jumper to clear the CMOS values (e.g. date information and BIOS configurations) and reset the CMOS values to factory defaults. To clear the CMOS values, place a jumper cap on the two pins to temporarily short the two pins or use a metal object like a screwdriver to touch the two pins for a few seconds.

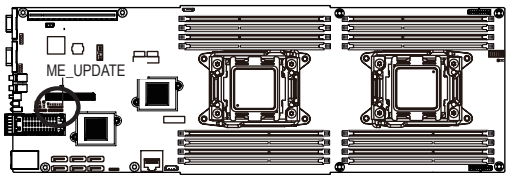


1 1-2 Close: Normal operation (Default setting)

1 2-3 Close: Clear CMOS data.

- Always turn off your computer and unplug the power cord from the power outlet before clearing the CMOS values.
- After clearing the CMOS values and before turning on your computer, be sure to remove the jumper cap from the jumper. Failure to do so may cause damage to the motherboard.

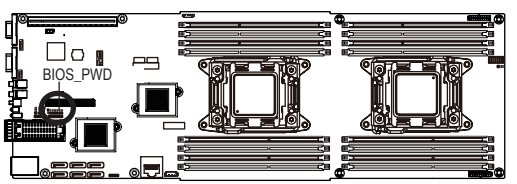
17) ME_UPDATE (ME Update Jumper)



1 1-2 Close: Normal operation (Default setting)

1 2-3 Close: ME updated.

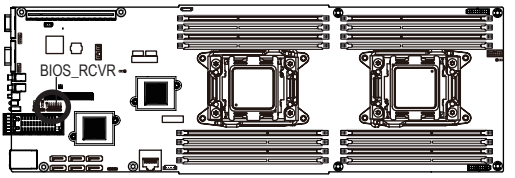
18) BIOS_PWD (Clearing Supervisor Password Jumper)



1 1-2 Close: Normal operation. (Default setting)

1 2-3 Close: Skip supervisor password.

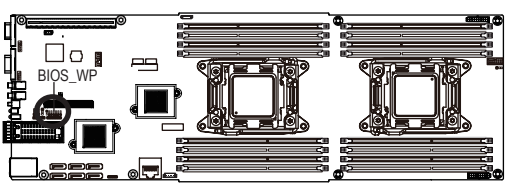
19) BIOS_RCVR (BIOS Recovery Jumper)



1 1-2 Close: Normal operation. (Default setting)

1 2-3 Close: BIOS recovery mode.

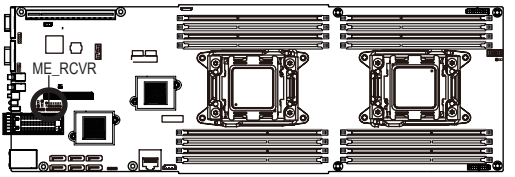
20) BIOS_WP (BIOS Write Protect Jumper)



1 1-2 Close: Normal operation. (Default setting)

1 2-3 Close: Enable BIOS write protect function.

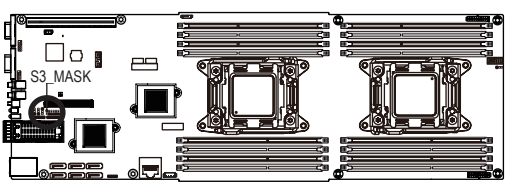
21) ME_RCVR (ME Recovery Jumper)



1 1-2 Close: Normal operation. (Default setting)

1 2-3 Close: ME recovery mode.

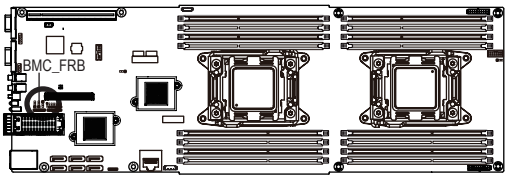
22) S3_MASK (S3 Power On Select Jumper)



1 1-2 Close: Stop an initial power on when BMC is not ready.

1 2-3 Close: Keep initial power on. (Default setting)

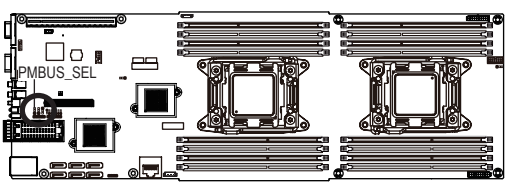
23) BMC_FRB (Force to Stop FRB Timer Jumper)



1 1-2 Close: Normal operation. (Default setting)

1 2-3 Close: Force to Stop FRB Timer.

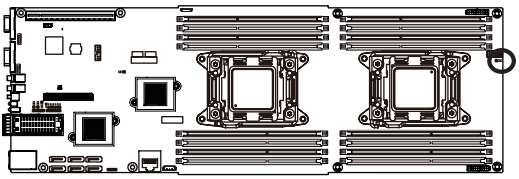
24) PMBUS_SEL (PMBus Power Select Jumper)



1 1-2 Close: PMBus connects to PCH.

1 2-3 Close: PMBus connects to BMC. (Default setting)

25) ACK_SEL (4 Nodes System and Rack System switch Jumper)



1 1-2 Close: 4 Node System.

1 2-3 Close: Rack System.

Chapter 2 BIOS Setup

BIOS (Basic Input and Output System) records hardware parameters of the system in the EFI on the motherboard. Its major functions include conducting the Power-On Self-Test (POST) during system startup, saving system parameters and loading operating system, etc. BIOS includes a BIOS Setup program that allows the user to modify basic system configuration settings or to activate certain system features. When the power is turned off, the battery on the motherboard supplies the necessary power to the CMOS to keep the configuration values in the CMOS.

To access the BIOS Setup program, press the <F2> key during the POST when the power is turned on.

- BIOS flashing is potentially risky, if you do not encounter problems of using the current BIOS version, it is recommended that you don't flash the BIOS. To flash the BIOS, do it with caution. Inadequate BIOS flashing may result in system malfunction.
- It is recommended that you not alter the default settings (unless you need to) to prevent system instability or other unexpected results. Inadequately altering the settings may result in system's failure to boot. If this occurs, try to clear the CMOS values and reset the board to default values. (Refer to the **Exit** section in this chapter or introductions of the battery/clearing CMOS jumper in Chapter 1 for how to clear the CMOS values.)

BIOS Setup Program Function Keys

<←><→>	Move the selection bar to select the screen
<↑><↓>	Move the selection bar to select an item
<+>	Increase the numeric value or make changes
<->	Decrease the numeric value or make changes
<Enter>	Execute command or enter the submenu
<Esc>	Main Menu: Exit the BIOS Setup program Submenus: Exit current submenu
<F1>	Show descriptions of general help
<F3>	Restore the previous BIOS settings for the current submenus
<F9>	Load the Optimized BIOS default settings for the current submenus
<F10>	Save all the changes and exit the BIOS Setup program

- **Main**
  This setup page includes all the items in standard compatible BIOS.
- **Advanced**
  This setup page includes all the items of AMI BIOS special enhanced features.
  (ex: Auto detect fan and temperature status, automatically configure hard disk parameters.)
- **Intel RC Setup**
  This setup page includes all the submenu options for configuring the function of processor, network, North Bridge, South Bridge, and System event logs.
- **Server Management**
  Server additional features enabled/disabled setup menus.
- **Security**
  Change, set, or disable supervisor and user password. Configuration supervisor password allows you to restrict access to the system and BIOS Setup.
  A supervisor password allows you to make changes in BIOS Setup.
  A user password only allows you to view the BIOS settings but not to make changes.
- **Boot**
  This setup page provides items for configuration of boot sequence.
- **Exit**
  Save all the changes made in the BIOS Setup program to the CMOS and exit BIOS Setup. (Pressing <F10> can also carry out this task.)
  Abandon all changes and the previous settings remain in effect. Pressing <Y> to the confirmation message will exit BIOS Setup. (Pressing <Esc> can also carry out this task.)

2-1 The Main Menu

Once you enter the BIOS Setup program, the Main Menu (as shown below) appears on the screen. Use arrow keys to move among the items and press <Enter> to accept or enter other sub-menu.

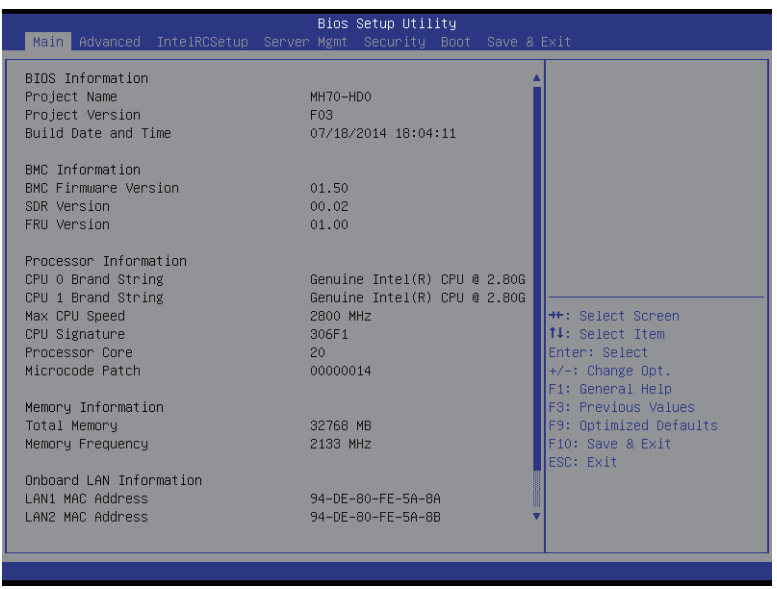
Main Menu Help

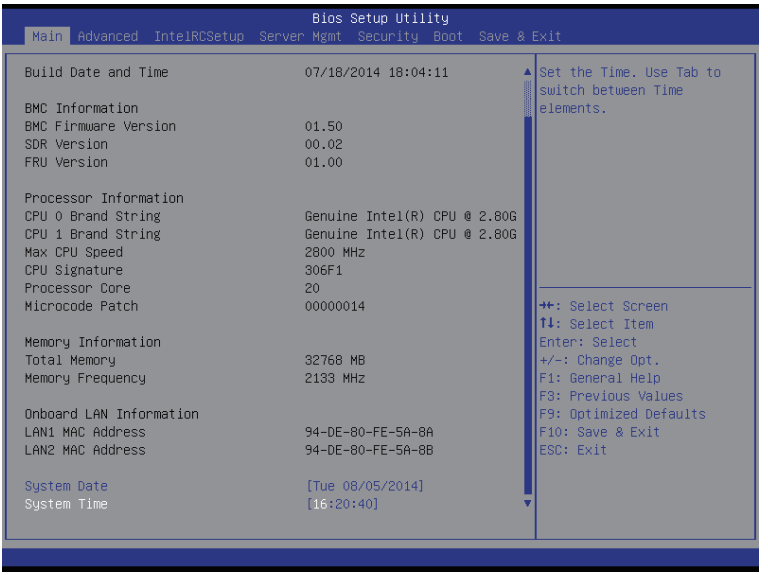
The on-screen description of a highlighted setup option is displayed on the bottom line of the Main Menu.

Submenu Help

While in a submenu, press <F1> to display a help screen (General Help) of function keys available for the menu. Press <Esc> to exit the help screen. Help for each item is in the Item Help block on the right side of the submenu.

- When the system is not stable as usual, select the **Restore Defaults** item to set your system to its defaults.
- The BIOS Setup menus described in this chapter are for reference only and may differ by BIOS version.





- **BIOS Information**
- **Porject Name**

  Display the project name information.
- **Porject Version**

  Display version number of the BIOS setup utility.
- **BIOS Build Date and Time**

  Displays the date and time when the BIOS setup utility was created.
- **BMC Information**
- **BMC Firmware Version**

  Display version number of the Firmware setup utility.
- **SDR Version**

  Display the SDR version information.
- **FRU Version**

  Display the FRU version information.
- **Processor Information**
- **CPU Brand String/Max CPU Speed/CPU Signature/Processors Core/Microcode Patch**

  Displays the technical specifications for the installed processor.
- **Memory Information**
- **Total Memory**

  Display the total memory size of the installed memory.
- **Memory Frequency**

  Display the frequency information of the installed memory.

☞ **Onboard LAN Information**

☞ **LAN1/LAN2 MAC Address**

Display LAN1/LAN2 MAC address information.

☞ **System Date**

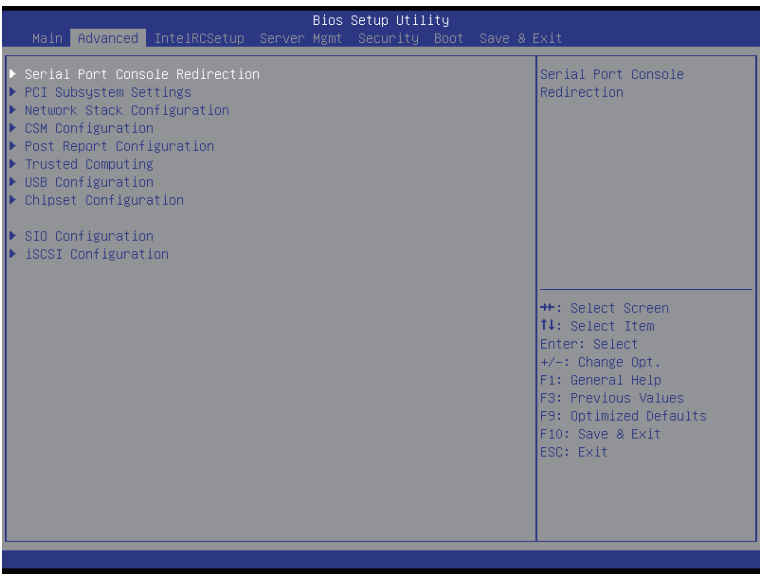
Set the date following the weekday-month-day- year format.

☞ **System Time**

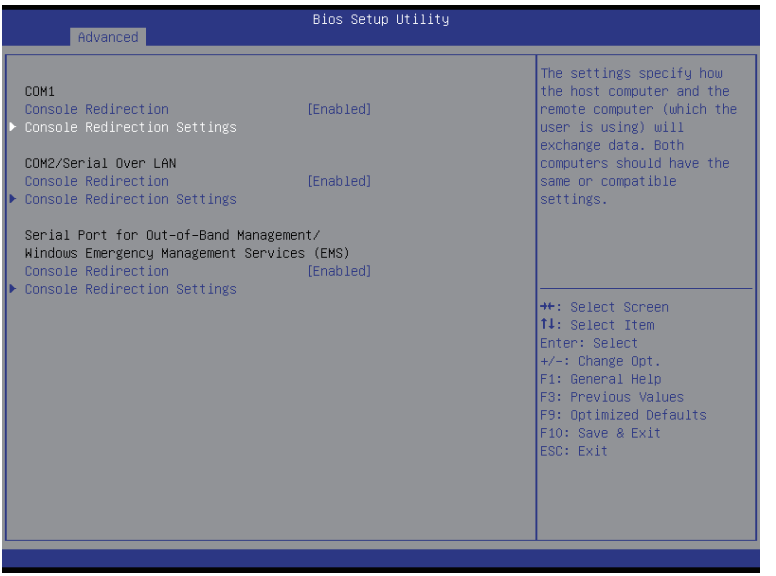
Set the system time following the hour-minute- second format.

2-2 Advanced Menu

The Advanced menu display submenu options for configuring the function of various hardware components. Select a submenu item, then press Enter to access the related submenu screen.



2-2-1 Serial Port Console Redirection



Bios Setup Utility
Advanced
COM2/Serial Over LAN
Console Redirection Settings
Terminal Type [ANSI]
Bits per second [115200]
Data Bits [8]
Parity [None]
Stop Bits [1]
Flow Control [None]
VT-UTF8 Combo Key Support [Enabled]
Recorder Mode [Disabled]
Resolution 100x31 [Enabled]
Legacy OS Redirection Resolution [80x24]
Putty KeyPad [VT100]
Redirection After BIOS POST [Always Enable]
Emulation: ANSI: Extended ASCII char set. VT100: ASCII char set. VT100+: Extends VT100 to support color, function keys, etc. VT-UTF8: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

Bios Setup Utility
Advanced
Out-of-Band Mgmt Port [COM1]
Terminal Type [VT-UTF8]
Bits per second [115200]
Flow Control [None]
Data Bits 8
Parity None
Stop Bits 1
Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.
→←: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F3: Previous Values
F9: Optimized Defaults
F10: Save & Exit
ESC: Exit

☞ COM1/COM2/Serial Over LAN Console Redirection Settings

☞ Console Redirection (Note)

Select whether to enable console redirection for specified device. Console redirection enables users to manage the system from a remote location.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ Console Redirection Settings

☞ Terminal Type

Select a terminal type to be used for console redirection.

Options available: VT100/VT100+/ANSI /VT-UTF8. Default setting is **ANSI**.

☞ Bits per second

Select the baud rate for console redirection.

Options available: 9600/19200/38400/57600/115200. Default setting is **115200**.

☞ Data Bits

Select the data bits for console redirection.

Options available: 7/8. Default setting is **8**.

☞ Parity

A parity bit can be sent with the data bits to detect some transmission errors.

Even: parity bi is 0 if the num of 1's in the data bits is even.

Odd: parity bit is 0 if num of 1's in the data bits is odd.

Mark: parity bit is always 1. Space: Parity bit is always 0.

Mark and Space Parity do not allow for error detection.

Options available: None/Even/Odd/Mark/Space. Default setting is **None**.

☞ Flow Control

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a 'stop' signal can be sent to stop the data flow. Once the buffers are empty, a 'start' signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.

Options available: None/Hardware RTS/CTS. Default setting is **None**.

☞ Stop Bits

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.

Options available: 1/2. Default setting is **1**.

☞ VT-UTF8 Combo Key Support (Note)

Enable/Disable VT-UTF8 Combo Key Support.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ Recorder Mode (Note)

When this mode enabled, only text will be send. This is to capture Terminal data.

Options available: Enabled/Disabled.

☞ Resolution 100x31 (Note)

Enables or disables extended terminal resolution. Default setting is **Enabled**.

Options available: Enabled/Disabled.

(Note) Advanced items prompt when this item is defined.

☞ **Legacy OS Redirection Resolution** (Note)

On Legacy OS, the number of Rows and Columns supported redirection.

Options available: 80x24/80X25. Default setting is **80x24**.

☞ **Putty KeyPad** (Note)

Select function FunctionKey and KeyPad on Putty.

Options available: VT100/LINUX/XTERMR6/SCO/ESCN/VT400. Default setting is **VT100**.

☞ **Redirection After BIOS POST** (Note)

This option allows user to enable console redirection after O.S has loaded.

Options available: Always Enable/Boot Loader. Default setting is **Always Enable**.

☞ **Out-of-Bnad Mgmt Port**

Microsoft Windows Emerency Management Service (EMS) allows for remote management of a Windows Server OS through a serial port.

Options available: COM1/COM2. Default setting is **COM1**.

(Note) Advanced items prompt when this item is defined.

2-2-2 PCI Subsystem Settings

☞ PCI Express Slot #1/#2 I/O ROM

When enabled, This setting will initialize the device expansion ROM for the related PCI-E slot.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ Onboard LAN#1/#2 Controller

Enable/Disable onboard LAN devices.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ Onboard LAN #1/#2 I/O ROM

Enable/Disable onboard LAN devices and initialize device expansion ROM.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ PCI Devices Common Settings

☞ PCI Latency Timer

Value to be programmed into PCI Latency Timer Register.

Options available: 32 PCI Bus Clocks/64 PCI Bus Clocks/96 PCI Bus Clocks/128 PCI Bus Clocks/160 PCI Bus Clocks/192 PCI Bus Clocks/224 PCI Bus Clocks/248 PCI Bus Clocks/.

Default setting is **32 PCI Bus Clocks**.

☞ VGA Palette Snoop

Enable/Disable VGA Palette Tegisters Snooping.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ Above 4G Decoding

Enable/Disable Above 4G Decoding.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **SR-IOV Support**

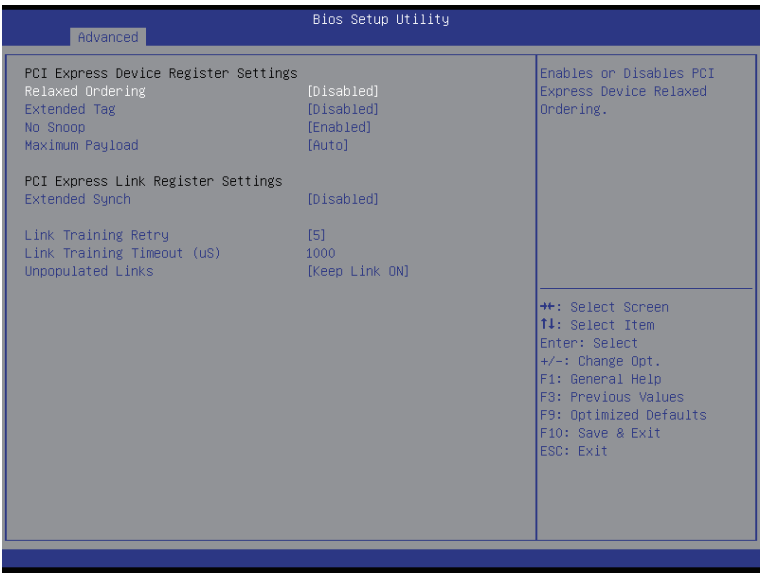
If system has SR-IOV capable PCIe Devices, this option enables or disables Single Root IO Virtualization Support.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **PCI Express Settings**

Press [Enter] for configuration of advanced items.

2-2-2-1 PCI Express Settings



☞ PCI Express Device Register Settings

☞ Relaxed Ordering

Enable/DIsable PCI Express Device Relaxed Ordering feature.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ Extended Tag

Wnen this feature is enabled, the system will allow device to use 8-bit Tag field as a requester.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ No Snoop

Enable/Disable PCI Express Device No Snoop option.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ Maximum Playload

Set maximum playload for PCI Express Device or allow system BIOS to select the value.

Options available: Auto/128 Bytes/256 Bytes/512 Bytes/1024 Bytes/2048 Bytes/4096 Bytes.

Default setting is **Auto**.

☞ PCI Express Link Register Settings

☞ Extended Synch

Wnen this feature is enabled, the system will allow generation of Extended Synchronization patterns.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ Link Training Retry

Define the number of Retry Attempts software wil take to retrain the link if previous training attempt was unsuccessful. Press <+> / <-> keys to increase or decrease the desired values.

☞ **Link Training Timeout (us)**

Define the number of Microseconds software will wait before polling 'Link Training' bit in Link Status register. Press <+> / <-> keys to increase or decrease the desired values. Value rang is from 10 to 10000 us.

☞ **Unpopulated Links**

When this item is set to 'Disable Link, the system will operate power save feature for those unpopulated PCI Express links.

Options available: Keep Link ON/ Disable Link. Default setting is **Keep Link ON**.

2-2-3 Network Stack

☞ **Network stack**

Enable/Disable UEFI network stack.

Options available: Enabled/DIsabled. Default setting is **Disabled**.

☞ **Ipv4 PXE Support**(Note)

Enable/Disable Ipv4 PXE feature.

Options available: Enabled/DIsabled. Default setting is **Enabled**.

☞ **Ipv6 PXE Support**(Note)

Enable/Disable Ipv6 PXE feature.

Options available: Enabled/DIsabled. Default setting is **Enabled**.

☞ **PXE boot wait time**(Note)

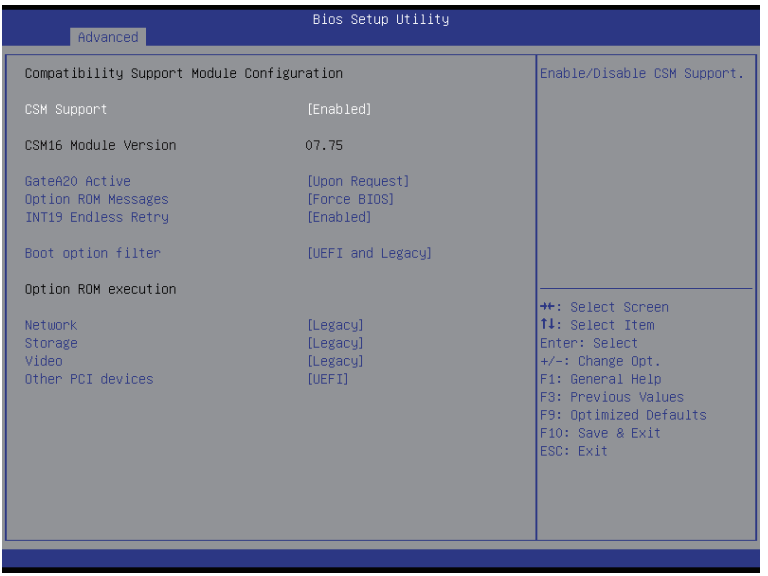
Press <+> / <-> keys to increase or decrease the desired values.

☞ **Media detect time**(Note)

Press <+> / <-> keys to increase or decrease the desired values.

(Note) This item appears when **Network Stack** is set to **Enabled**.

2-2-4 CSM Configuration



☞ **Compatibility Support Module Configuration**

☞ **CSM Support**

Enable/Disable Compatibility Support Module (CSM) support.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **CSM16 Module Version**

Display CSM Module version information.

☞ **Gate20 Active**

Upon Request: GA20 can be disabled using BIOS services.

Always: Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Options available: Upon Request/Always. Default setting is **Upon Request**.

☞ **Option ROM Messages**

Option ROM Messages.

Options available: Force BIOS/Keep Current. Default setting is **Force BIOS**.

☞ **INT19 Endless Retry**

Enabled: Allowed headless retry boot

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Boot option filter**

Determines which devices system will boot to.

Options available: UEFI and Legacy/Legacy only/UEFI only. Default setting is **UEFI and Legacy**.

☞ **Option ROM execution**

☞ **Network**

Controls the execution UEFI and Legacy PXE OpROM.

Options available: Do not launch/UEFI/Legacy. Default setting is **Legacy**.

☞ **Storage**

Controls the execution UEFI and Legacy Storage OpROM.

Options available: Do not launch/UEFI/Legacy. Default setting is **Legacy**.

☞ **Video**

Controls the execution UEFI and Legacy Video OpROM.

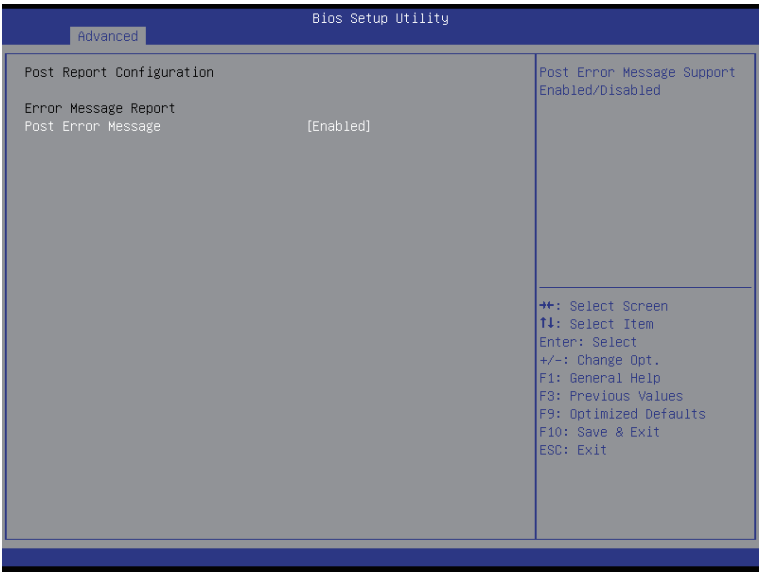
Options available: Do not launch/UEFI/Legacy. Default setting is **Legacy**.

☞ **Other PCI devices**

Determines OpROM execution policy for devices other than network, Storage, or Video.

Options available: UEFI/Legacy. Default setting is **UEFI**.

2-2-5 Post Report Configuration



☞ **Post Report Configuration**

☞ **Error Message Report**

☞ **Post Error Message**

Enable/Disable Info Error Message support.

Options available: Enabled/Disabled. Default setting is **Enabled**.

2-2-6 Trusted Computing

☞ **Configuration**

☞ **Security Device Support**

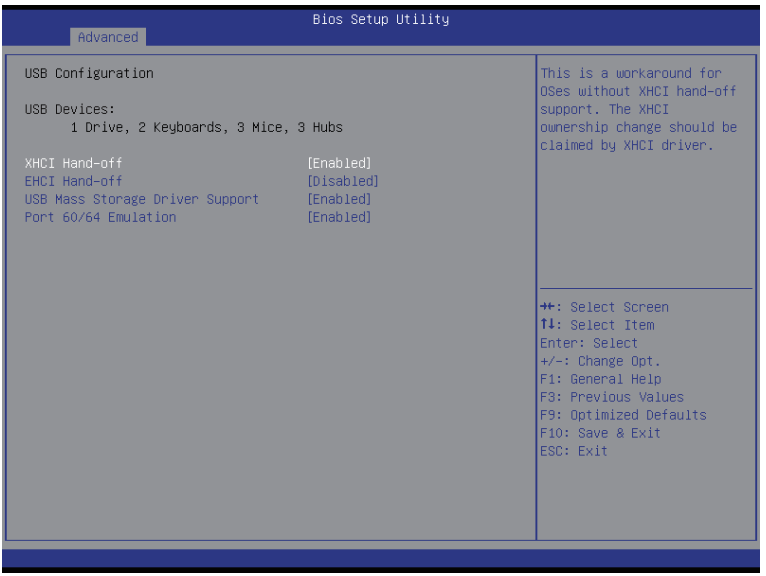
Select Enabled to activate TPM support feature.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Current Status Information**

Display current TPM status information.

2-2-7 USB Configuration



☞ **USB Configuration**

☞ **USB Devices:**

Display the USB devices connected to the system.

☞ **XHCI Hand-off**

Enable/Disable XHCI (USB 3.0) Hand-off support.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **EHCI Hand-off**

Enable/Disable EHCI (USB 2.0) Hand-off function.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **USB Mass Storage Driver Support**(Note)

Enable/Disable USB Mass Storage Driver Support.

Options available: Enabled/Disabled. Default setting is **Enabled**.

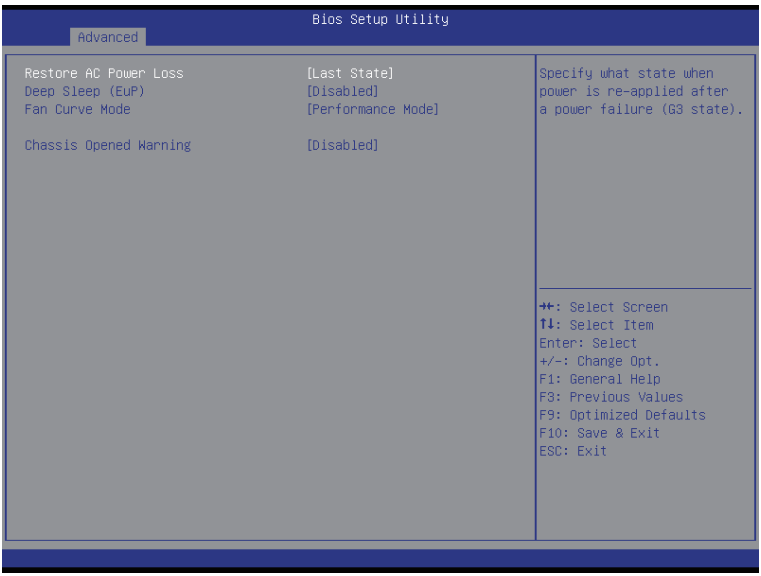
☞ **Port 60/64 Emulation**

Enable I/O port 60h/64h emulation support. This should be enabled for the complete USB Keyboard Legacy support for non-USB aware OS.

Options available: Enabled/Disabled. Default setting is **Enabled**.

(Note) This item is present only if you attach USB types of device.

2-2-8 Chipset Configuration



☞ **Restore on AC Power Loss** (Note)

Defines the power state to resume to after a system shutdown that is due to an interruption in AC power. When set to Last State, the system will return to the active power state prior to shutdown. When set to Stay Off, the system remains off after power shutdown.

Options available: Last State/Stay Off/Power On. The default setting depends on the BMC setting.

☞ **Deep Sleep (EuP)**

Enable/Disable Deep Sleep mode.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Fan Curve Mode**

Configure ystem fan curve mode

Options available: Full Dpeed Mode/Performance ModeBalanced mode/Energy Saving Mode.

Default setting is **Performance Mode**.

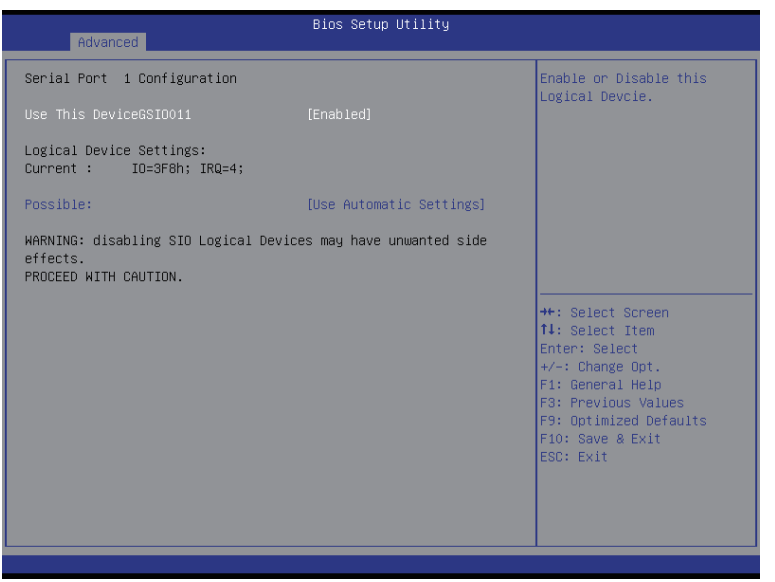
☞ **Chassis Opened Warning**

Enable/Disable Chassis intrusion alter funtion.

Options available: Enabled/Disabled. Default setting is **Enabled**.

(Note) When the power policy is controlled by BMC, please wait for 15-20 seconds for BMC to save the last power state.

2-9 SIO Configuration



- **AMI SIO Driver Version**

  Display the AMI SIO driver version information.

- **Super IO Chip Logical Device(s) Configuration**

- **[*Active*] Serial Port 1/2**

  Press [Enter] for confuguration of advanced items.

- **Serial Port 1 Configuration**

- **Use This Device**

  When enabled allows you to configure the serial port 1 settings. When set to Disabled, displays no configuration for the serial port.

  Options available: Enabled/Disabled. Default setting is **Enabled**.

- **Logical Device Settings:**

- **Current:**

  Display the Serial Port 1 base I/O addressand IRQ.

☞ **Possible:**

Configure Serial Port 1 base I/O addressand IRQ.
Option available:
Use Automatic Settings
IO=3F8h; IRQ=4; DMA;/
IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA;.
Default setting is **Use Automatic Settings**.

☞ **Serial Port 2 Configuration**

☞ **Use This Device**

When enabled allows you to configure the serial port 2 settings. When set to Disabled, displays no configuration for the serial port.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Logical Device Settings:**

☞ **Current:**

Display the Serial Port 2 base I/O addressand IRQ.

☞ **Possible:**

Configure Serial Port 2 base I/O addressand IRQ.
Option available:
Use Automatic Settings/
IO=2F8h; IRQ=3; DMA;/
IO=3F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=2F8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=3E8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
IO=2E8h; IRQ=3,4,5,7,9,10,11,12; DMA;/
Default setting is **Use Automatic Settings**.

2-2-10 iSCSI Configuration

☞ **iSCSI Initiator Name**

☞ **Add an Attempts**

Press [Enter] for configuration of advanced items.

☞ **Delete Attempts**

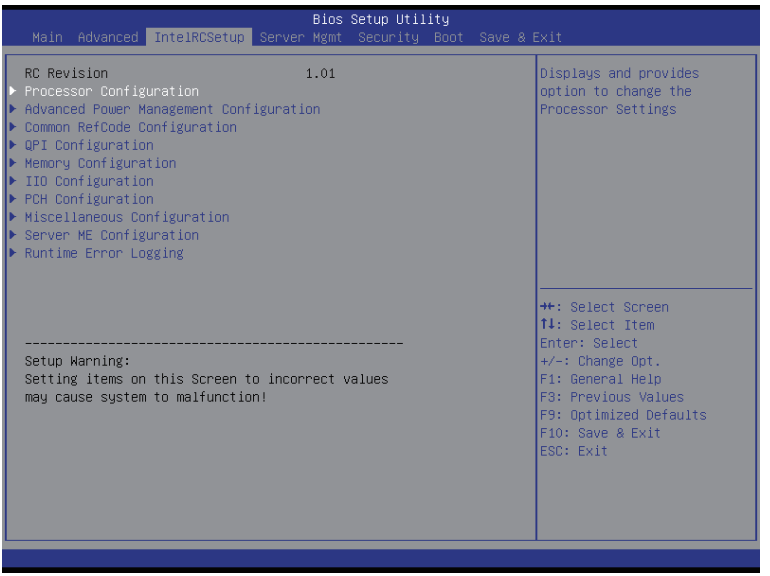
Press [Enter] for configuration of advanced items.

☞ **Change Attempt Order**

Press [Enter] for configuration of advanced items.

2-3 Intel RC Setup Menu

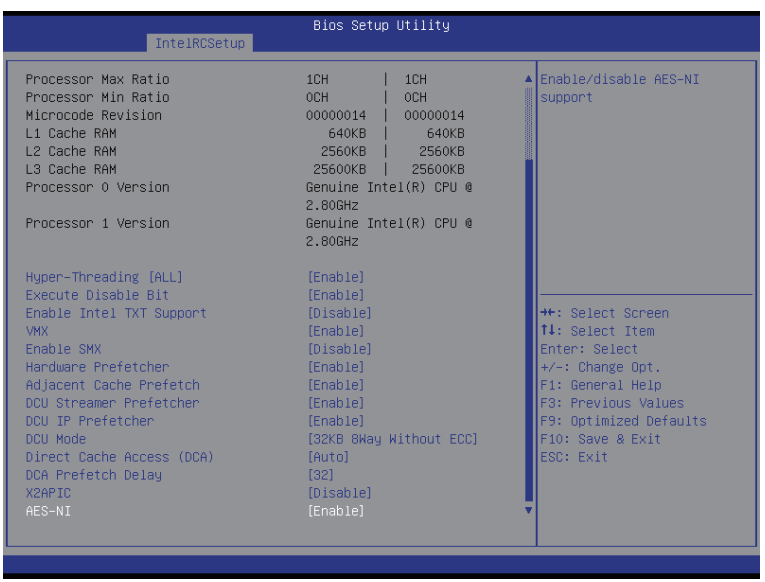
Intel RC Setup menu displays submenu options for configuring the function of North Bridge and South Bridge. Select a submenu item, then press Enter to access the related submenu screen.



☞ RC Revision

Display Intel RC version information.

2-3-1 Processor Configuration



☞ **Processor Configuration**

☞ **Pre-Socket Configuration**

Press [Enter] for configuration of advanced items.

☞ **Processor Socket/Processor ID/Processor Frequency/Processor Max Raito/ Processor Min Raio/Microcode Revision/L1 Cache RAM/L2 Cache RAM/L3 Cache RAM/ Processor 0/1Version**

Displays the technical specifications for the installed processor.

☞ **Hyper-Threading [All]**

The Hyper Threading Technology allows a single processor to execute two or more separate threads concurrently. When hyper-threading is enabled, multi-threaded software applications can execute their threads, thereby improving performance.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Execute Disable Bit**

When enabled, the processor prevents the execution of code in data-only memory pages. This provides some protection against buffer overflow attacks.
When disabled, the processor will not restrict code execution in any memory area. This makes the processor more vulnerable to buffer overflow attacks.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Enable Intel TXT Support**

Enable/Disable Intel Trusted Execution Technology support function.
Options available: Enabled/Disabled. Default setting is **Disabled.**

☞ **VMX (Vanderpool Technology)**

Enable/Disable Vanderpool Technology. This will take effect after rebooting the system.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Enable SMX (Intel Safer Mode Extensions Technology)**

Enable/Disblae Intel Safer Mode Extensions (SMX) support function.
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Hardware Prefetcher**

Select whether to enable the speculative prefetch unit of the processor.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Adjacent Cache Line Prefetch**

When enabled, cache lines are fetched in pairs. When disabled, only the required cache line is fetched.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **DCU Streamer Prefetch**

Enable prefetch of next L1 Data line based upon multiple loads in same cache line.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **DCU IP Prefetch**

Enable prefetch of next L1 Data line based upon sequential load history.
Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **DCU Mode**

Configure DCU mode.
Options available: 32KB 8Way Without ECC/16KB 4Way With ECC. Default setting is **32KB 8Way Without ECC**.

☞ **Direct Cache Access (DCA)**

Options available: Auto/Enabled/Disabled. Default setting is **Auto**.

☞ **DCA Prefetch Delay**

Options available: Disabled/8/16/24/32/40/48/56/64/72/80/88/96/104/112. Default setting is **32**.

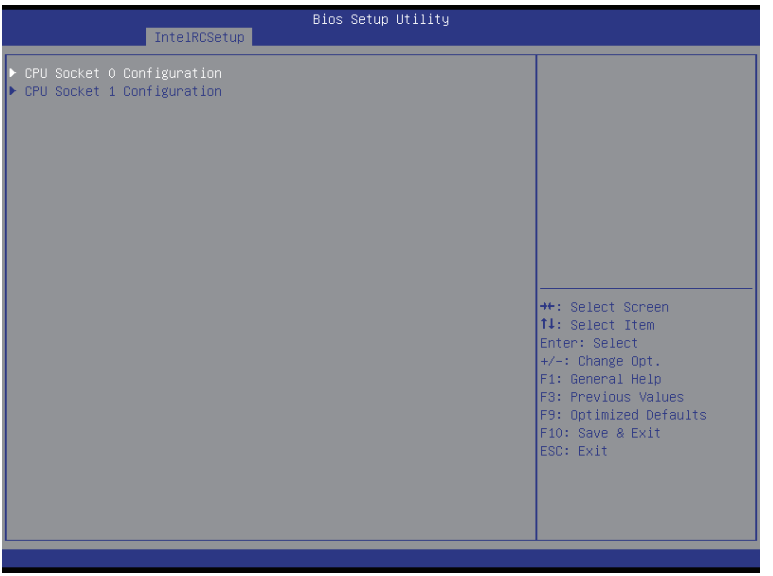
☞ **X2APIC**

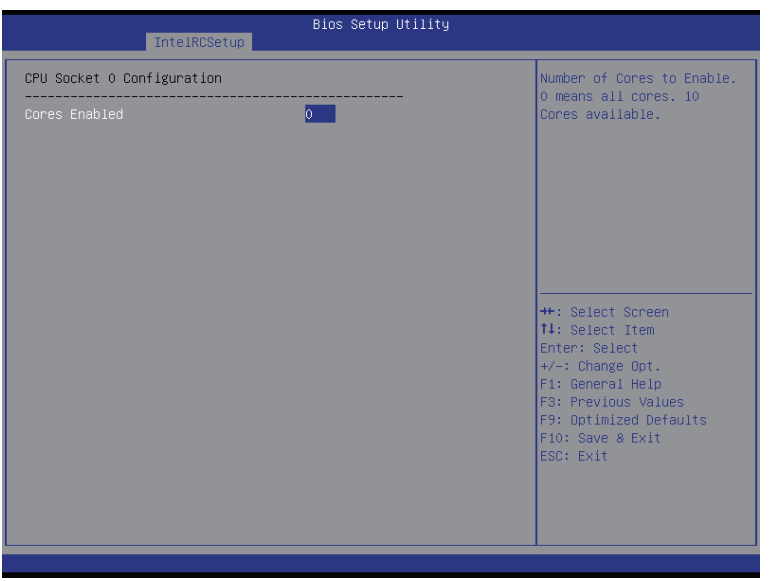
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **AES-NI**

Enable/Disable AES-NI (Intel Advanced Encryption Standard New Instructions) support function.
Options available: Enabled/Disabled. Default setting is **Enabled**.

2-3-1-1 Pre-Socket Configuration





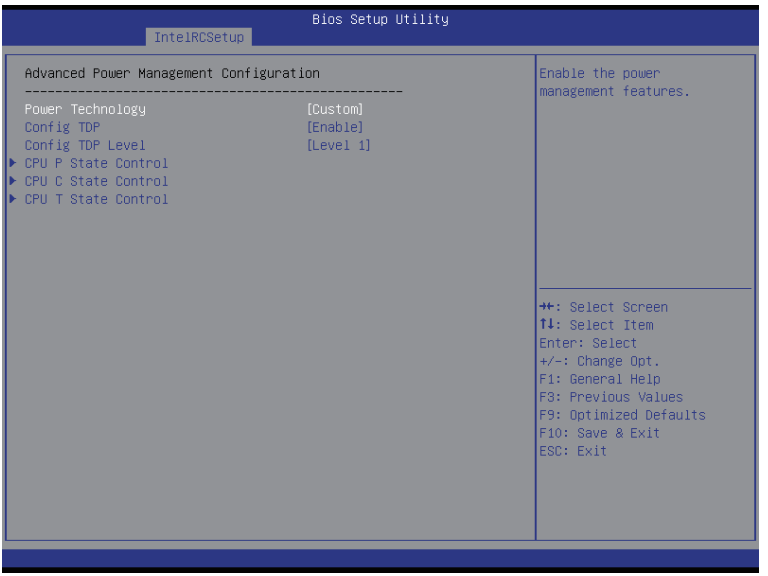
☞ **CPU Socket 0/1 Configuration**

Press [Enter] for configuration of advanced items.

☞ **Cores Enabled (for CPU socket 0/1)**

Number of Cores to enable. 0 means all cores. 14 Cores is available. Press the numeric keys to adjust desired values.

2-3-2 Advanced Power Management Configuration



☞ **Advanced Power Management Configuration**

☞ **Power Technology**

Option available:Disable/Energy Efficient/Custom. Default setting is **Custom**.

☞ **Config TDP**

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Config TDP Level**

Options available: Nominal. Default setting is **Nominal**.

☞ **CPU P State Control**

Press [Enter] for configuration of advanced items.

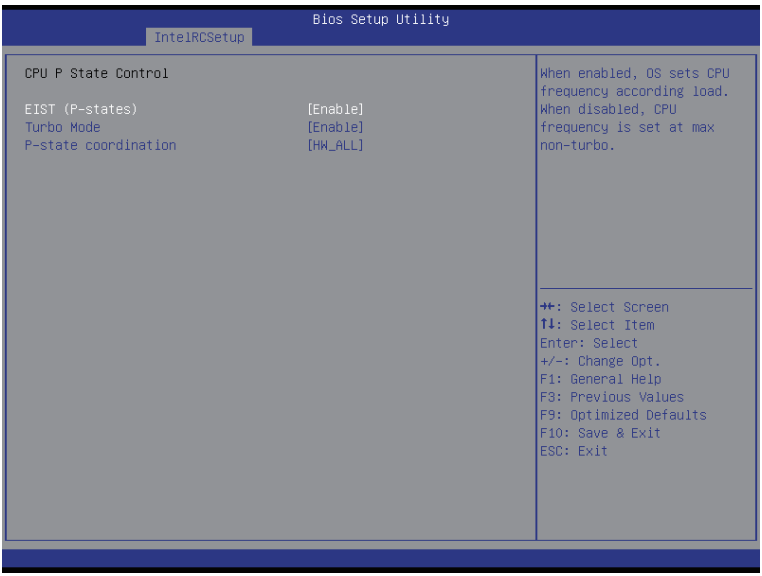
☞ **CPU C State Control**

Press [Enter] for configuration of advanced items.

☞ **CPU T State Control**

Press [Enter] for configuration of advanced items.

2-3-2-1 CPU P State Control



☞ EIST (P-State)

Conventional Intel SpeedStep Technology switches both voltage and frequency in tandem between high and low levels in response to processor load.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ Turbo Mode

When this item is enabled, tje processor will automatically ramp up the clock speed of 1-2 of its processing cores to improve its performance.

When this item is disabled, the processor will not overclock any of its core.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ P-state coordination

In HW_ALL mode, the processor hardware is responsible for coordinating the P-state among logical processors dependencies. The OS is responsible for keeping the P-state request up to date on all logical processors.

In SW_ALL mode, the OS Power Manager is responsible for coordinating the P-state among logical processors with dependencies and must initiate the transition on all of those Logical Processors.

In SW_ANY mode, the OS Power Manager is responsible for coordinating the P-state among logical processors with dependencies and may initiate the transition on any of those Logical Processors.

Options available: HW_ALL/SW_ALL/SW_ANY. Default setting is **HW_ALL**.

2-3-2-2 CPU C State Control

☞ Package C State Limit

Configure state for the C-State package limit.

Options available: C0/C1 state/C2 state/C6(non Retention) state/C6(Retention) state.

Default setting is **C6(non Retention) state**.

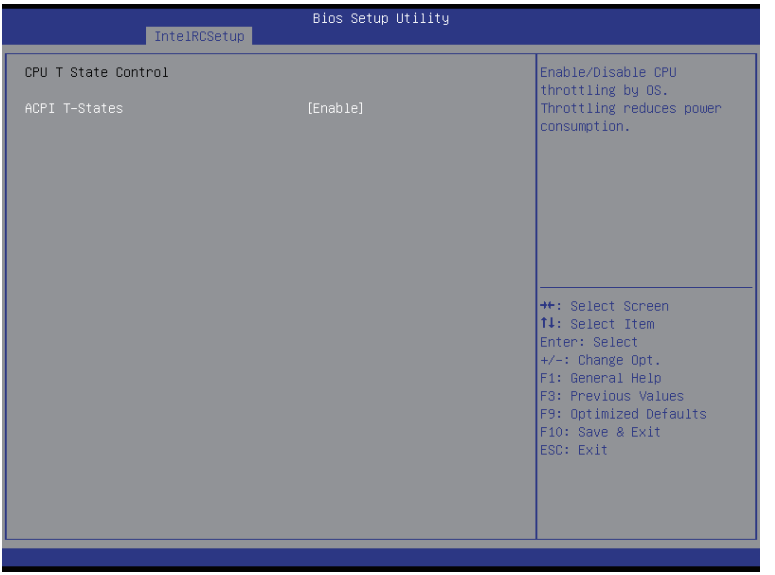
☞ CPU C3/C6 Report

Allows you to determine whether to let the CPU enter C3/C6 mode in system halt state. When enabled, the CPU core frequency and voltage will be reduced during system halt state to decrease power consumption. The C3/C6 state is a more enhanced power-saving state than C1.

Options available: Enabled/Disabled.

Default setting for C3 is **Disabled**; default setting for C6 is **Enabled**.

2-3-2-3 CPU T State Control



☞ ACPI T-States

Enable/Disable CPU throttling by OS. Thorttling reduces power comsumption.

Options available: Enabled/Disabled. Default setting is **Enabled**.

2-3-3 Common RefCode Configuration

☞ **Common RefCode Configuration**

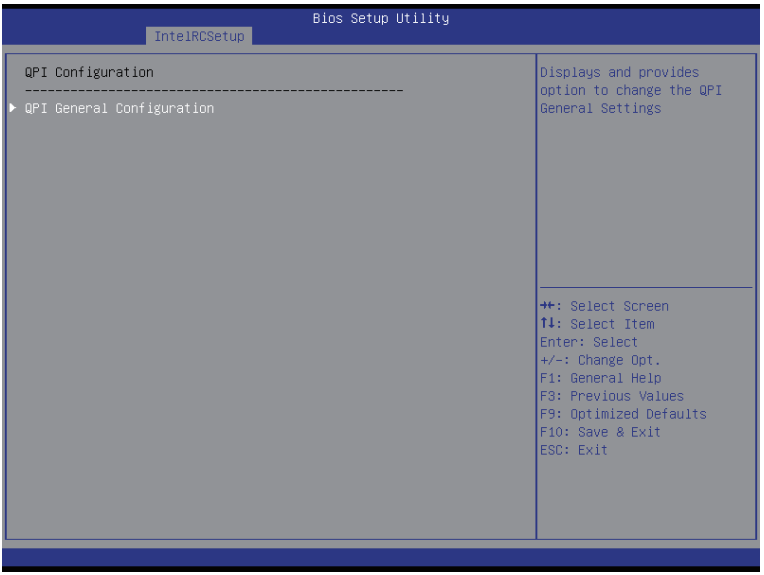
☞ **Isoc Mode**

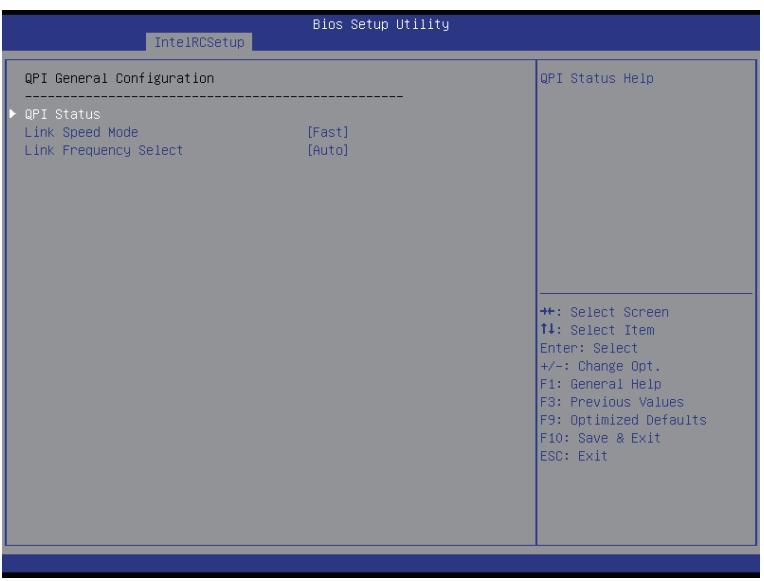
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Numa (Non-Uniform Memory Access)**

Options available: Enabled/Disabled. Default setting is **Enabled**.

2-3-4 QPI Configuration





☞ QPI General Configuration

Press [Enter] for configuration of advanced items.

☞ QPI Status

Press [Enter] to view QPI status.

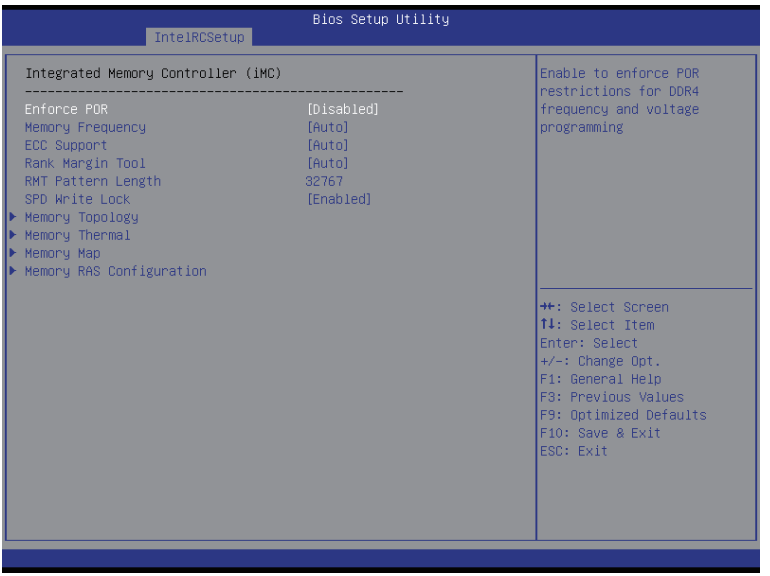
☞ Link Speed Mode

Options available: Slow/Fast. Default setting is **Fast**.

☞ Link Frequency Select

Options available: 6.4GB/s/8.0GB/s/9.6GB/s/Auto/Auto Limited. Default setting is **Auto**.

2-3-5 Memory Configuration



☞ **Integrated Memory Controller (iMC)**

☞ **Enforce POR**

Enable to enforce POR restrictions for DDR4 frequency and voltage programming.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Memory Frequency**

Configure memory frequency.

Options available: Auto/1333/1400/1600/1800/1867/2000/2133.

Default setting is **Auto**.

☞ **ECC Support**

Options available: Auto/Disabled/Enabled. Default setting is **Auto**.

☞ **Rank Margin Tool**

Options available: Auto/Disabled/Enabled. Default setting is **Auto**.

☞ **RMT Pattern Length**

Display RMT Pattern Length.

☞ **SPD Write Lock**

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Memory Topology**

Press [Enter] for configuration of advanced items.

☞ **Memory Thermal**

Press [Enter] for configuration of advanced items.

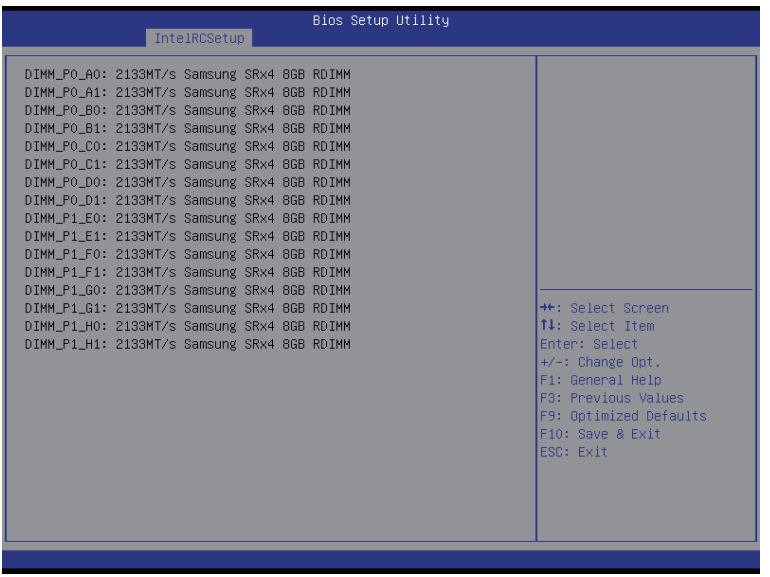
☞ **Memory Map**

Press [Enter] for configuration of advanced items.

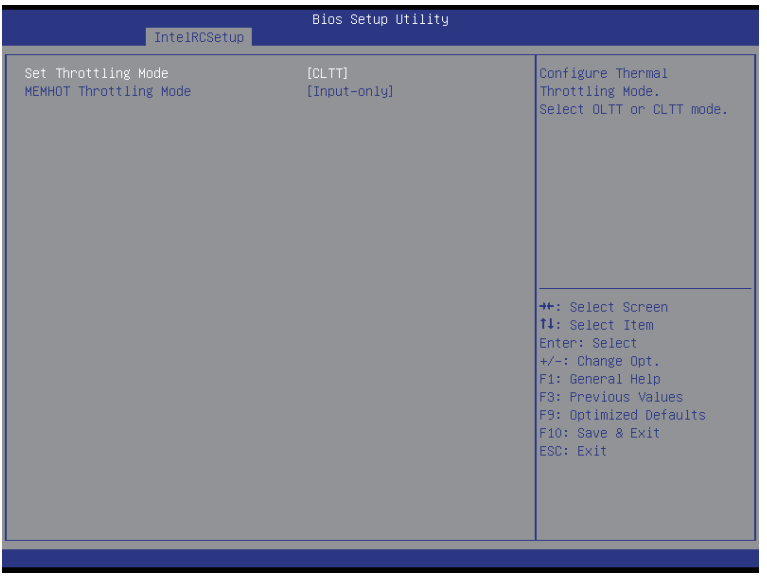
☞ **Memory RAS Configuration**

Press [Enter] for configuration of advanced items.

2-3-5-1 Memory Topology



2-3-5-2 Memory Thermal



☞ Set Throttling

Configure Thermal Throttling Mode. Select OLTT or CLTT mode.

Options available: Disabled/OLTT/CLTT. Default setting is **CLTT**.

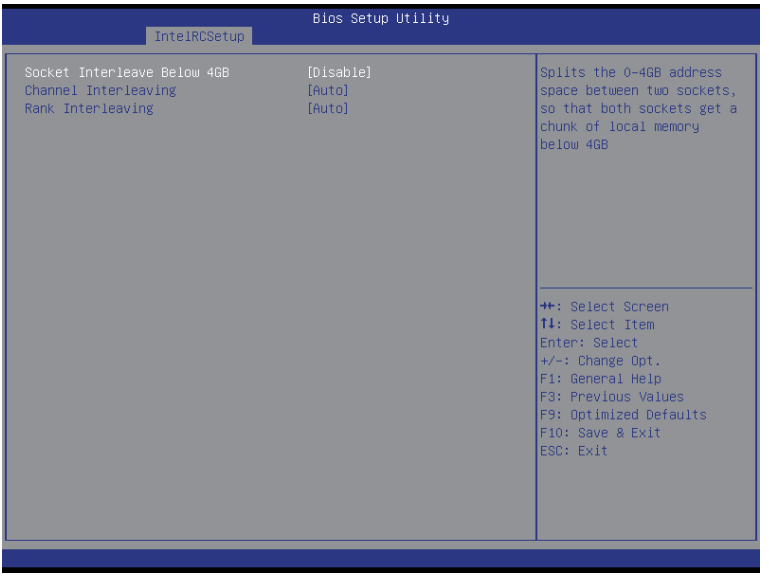
☞ DIMM Temp Stat

Display DIMM Temp Stat.

☞ MEMHOT Throttling Mode

Options available: Disabled/Output-only/Input-only. Default setting is **Input-only**.

2-3-5-3 Memory Map



☞ Socket Interleave Below 4GB

Splits the 0-4GB address space between two sockets, so that both sockets get a chunk of local memory below 4GB.

Options available: Disabled/Enabled. Default setting is **Disabled**.

☞ Channel Interleaving

Options available: Auto/1-way Interleave/2-way Interleave/3-way Interleave/4-way Interleave. Default setting is **Auto**.

☞ Rank Interleaving

Options available: Auto/1-way Interleave/2-way Interleave/4-way Interleave/8-way Interleave. Default setting is **Auto**.

2-3-5-4 Memory RAS Configuration

☞ RAS Mode

Enable/Disable RAS modes. Enabling Sparing and Mirroring is not supported. When this item is set to enabled, Sparing will be selected.

Options available: Disable/Mirror/Lockstep Mode. Default setting is **Disabled**.

☞ Lockstep x4 DIMMs

Options available: Auto/Disabled/Enabled. Default setting is **Disabled**.

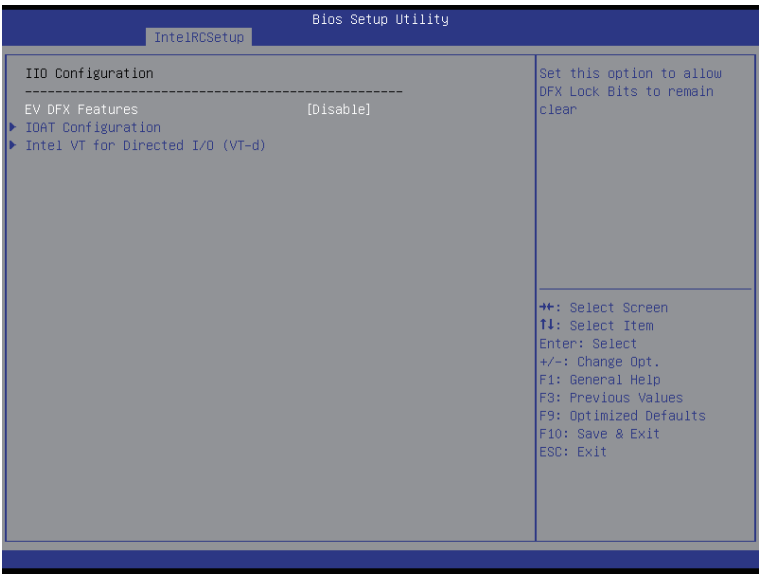
☞ Lockstep Rank Sparing

Options available: Auto/Disabled/Enabled. Default setting is **Disabled**.

☞ Correctable Error Threshold

Press <+> / <-> keys to increase or decrease the desired values.

2-3-6 IIO Configuration



☞ **IIO Configuration**

☞ **EV DFX Features**

Set this option to allow DFX Lock Bits to remain clear.

Options available: Enabled/Disabled. Default setting is **Disabled**.

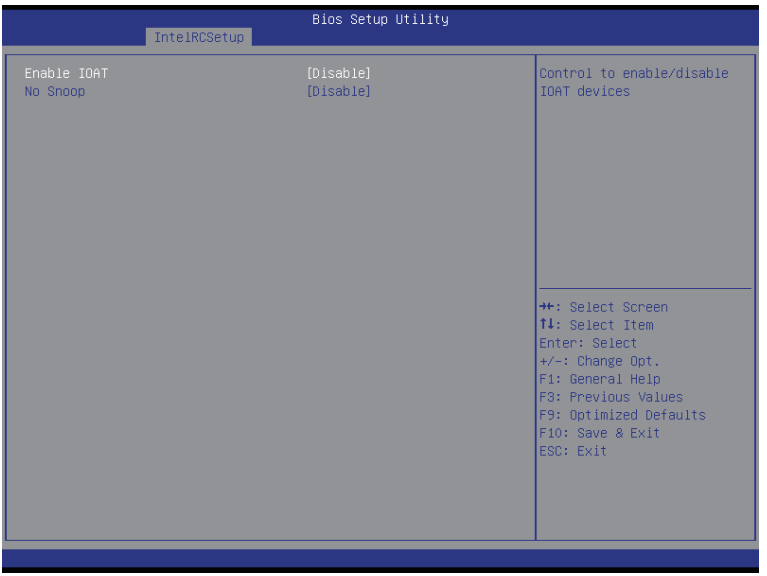
☞ **IOAT Configuration**

Press [Enter] for configuration of advanced items.

☞ **Intel VT for Directed I/O (VT-d)**

Press [Enter] for configuration of advanced items.

2-3-6-1 IOAT Configuration



☞ **IOAT Configuration**

☞ **Enable IOAT**

Control to enable/disable IOAT (Intel I/O Acceleration Technology) device.

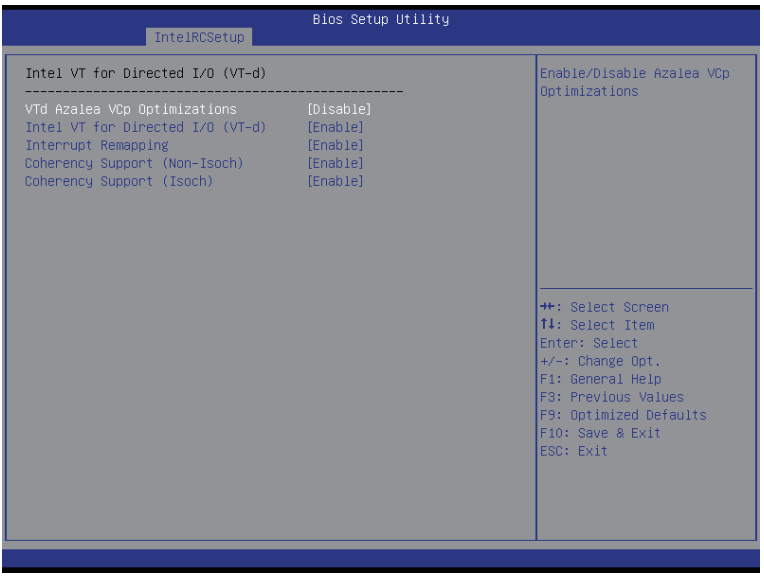
Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **No Snoop**

Enable/Disable PCI Express Device No Snoop option.

Options available: Enabled/Disabled. Default setting is **Disabled**.

2-3-6-2 Intel VT for Directed I/O (VT-d)



☞ **Intel VT for Directed I/O (VT-d)**

☞ **VT-d Azalea VCp Optimizations**

Enable/Disable Azalea VCp optimizations.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Intel VT for Directed I/O (VT-d)**

Enable/Disable Intel VT for Directed I/O (VT-d) support function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Interrupt Remapping**

Enable/Disable interrupt remapping support function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Coherency Suuport (Non-Isoch)**

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Coherency Suuport (Isoch)**

Options available: Enabled/Disabled. Default setting is **Enabled**.

2-3-7 PCH Configuration

☞ **PCH Configuration**

☞ **PCH Devices**

Press [Enter] for configuration of advanced items.

☞ **PCH SATA Configuration**

Press [Enter] for configuration of advanced items.

☞ **USB Configuration**

Press [Enter] for configuration of advanced items.

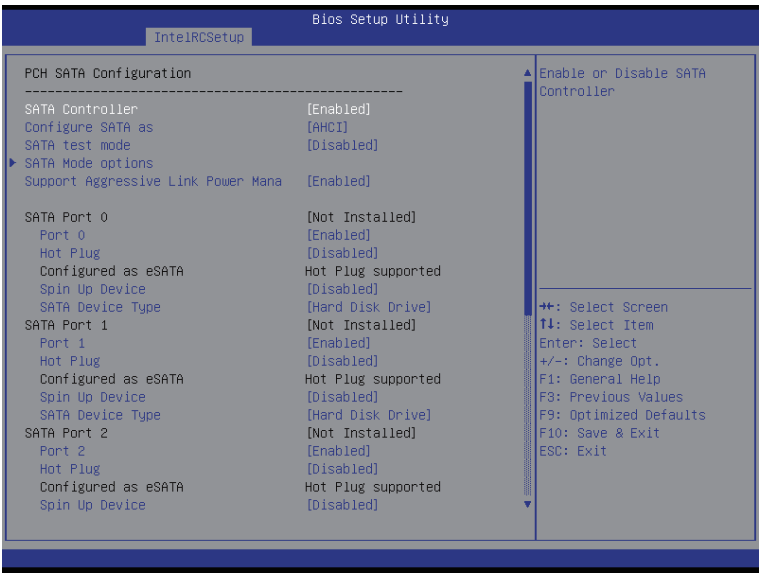
2-3-7-1 PCH Devices

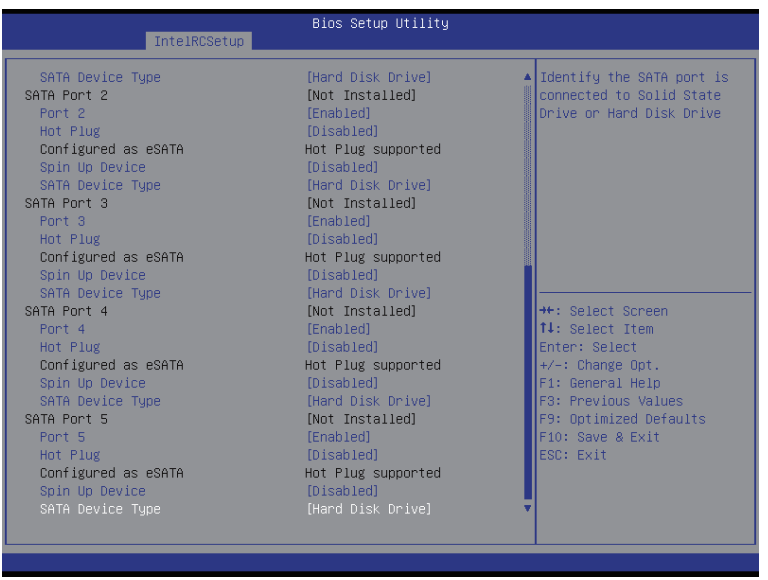
☞ **PCH CRID**

Enable/Disable Intel Compatible Revision ID.

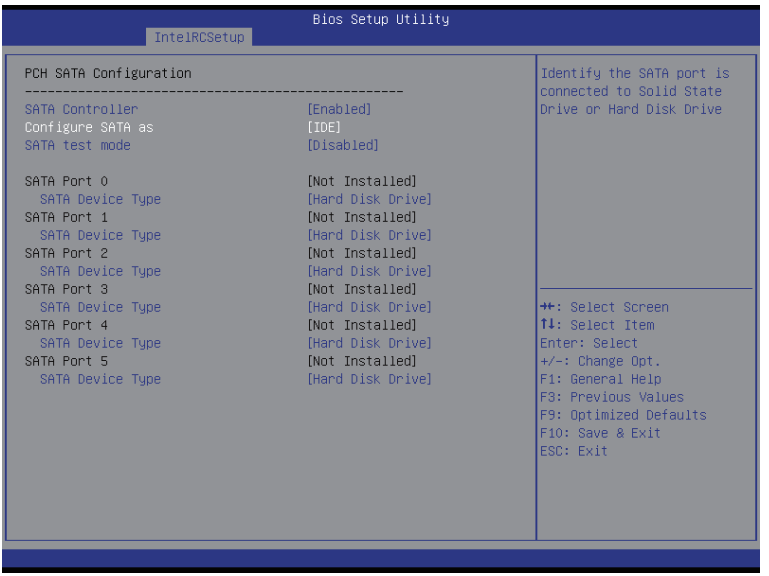
Options available: Enabled/Disabled. Default setting is **Disabled**.

2-3-7-2 PCH SATA Configuration





When SATA Type is set to IDE



☞ **PCH SATA Configuration**

☞ **SATA Controller(s)**

Enable/Disable sSATA controller.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Configure sSATA as**

Coonfigure on chip SATA type.

IDE Mode: When set to IDE, the SATA controller disables its RAID and AHCI functions and runs in the IDE emulation mode. This is not allowed to access RAID setup utility.

RAID Mode: When set to RAID, the SATA controllerenables both its RAID and AHCI functions. You will be allows access the RAID setup utility at boot time.

ACHI Mode: When set to AHCI,the SATA controller enables its AHCI functionality. Then the RAID function is disabled and cannot be access the RAID setup utility at boot time.

Options available: IDE/RAID/ACHI/Disabled. Default setting is **ACHI**.

☞ **SATA Test Mode**

Enable/Disable SATA Test Mode.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **SATA RSTe Boot Info**(Note 1)

Enable/Disable SATA RSTe Boot Information.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **SATA Mode options**(Note 2)

Press [Enter] for configuration of advanced items.

(Note 1) Only Supported When HDD is in **RAID** Mode.

(Note 2) Only Supported When HDD is in **AHCI** or **RAID** Mode.

☞ **Support Aggressive Link Power Mana(Note)**

Enable PCH to aggressively enter link power state.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Alternate Device ID on RAID**

Enable /Disable Alternate Device ID on RAID mode.

Options available: Enabled/Disabled. Default setting is **Disabled**.

Please note that this option appears when HDD is in RAID Mode.

☞ **SATA Port 0/1/2/3/4/5**

The category identifies sSATA type of hard disk that are installed in the computer.

System will automatically detect HDD type.

☞ **Port 0/1/2/3/4/5**

Enable/Disable Port 0/1/2/3 device.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Hot Plug (for Port 0/1/2/3/4/5)(Note)**

Enable/Disable HDD Hot-Plug function.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Configured as eSATA(Note)**

Display Hot-Plug supported information.

☞ **Spin Up Device (for Port 0/1/2/3/4/5)(Note)**

On an edge detect from 0 to 1, the PCH starts a COM reset initialization to the device.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **SATA Device Type**

Select sSATA device type.

Options available: Hard Disk Drive/Solid State Drive. Default setting is **Hard Disk Drive**.

(Note) Only Supported When HDD is in **AHCI** or **RAID** Mode.

2-3-7-2-1 SATA Mode Options

When SATA Type is set to IDE/AHCI Mode

☞ **SATA LED locate**

When this option is enabled, LED/SGPIO hardware is attached.

Options available: Enabled/Disabled. Default setting is **Enabled**.

When SATA Type is set to RAID Mode

☞ **SATA LED locate**

When this option is enabled, LED/SGPIO hardware is attached.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Intel Rapid Recovery Technology**

Enable/Disable Intel Rapid Recovery Technology support function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **RAID Option ROM UI banner**

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Smart Response Technology**

Enable/Disable Intel Smart Response Technology support function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **RAID OROM prompt delay**

Options available: 2 Seconds/4 Seconds/6 Seconds/8 Seconds. Default setting is **2 Seconds**.

2-3-7-3 USB Configuration

☞ USB Precondition

Precondition work on USB host conteoller and root ports for faster enumeration.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ xHCI Mode

Enable/Disable xHCI (USB 3.0) support function.

Options available: Smart Auto/Enabled/Disabled. Default setting is **Smart Auto**.

2-3-8 Miscellaneous Configuration

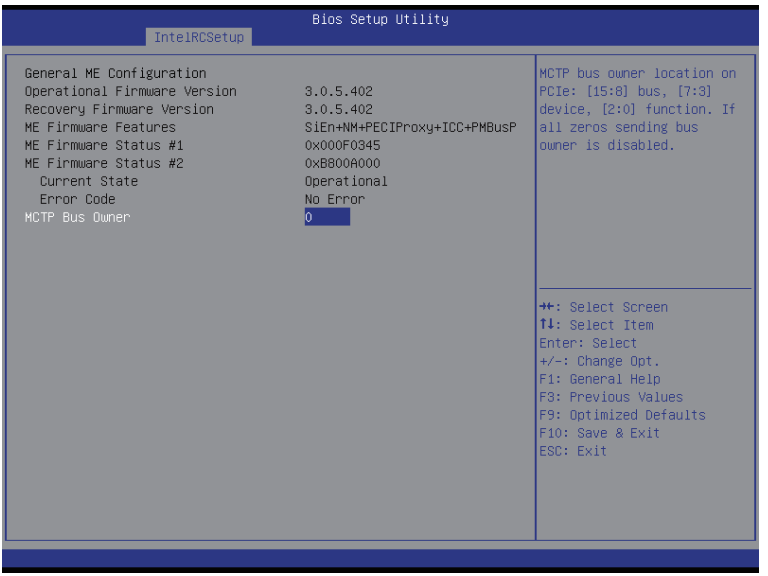
☞ **Miscellaneous Configuration**

☞ **Active Video**

Select active Video type.

Options available: Onboard Device/Offboard Device. Default setting is **Offboard Device**.

2-3-9 Server ME Configuration



☞ **Greneral ME Configuration**

☞ **Operational Firmware Version**

Display Operational Firmware Version information.

☞ **Recovery Firmware Version**

Display Recovery Firmware Version information.

☞ **ME Firmware Features**

Display ME Firmware features information.

☞ **ME Firmware Status #1/#2**

Display ME Firmware status information.

☞ **Current State (for ME Firmware)**

Display ME Firmware current status information.

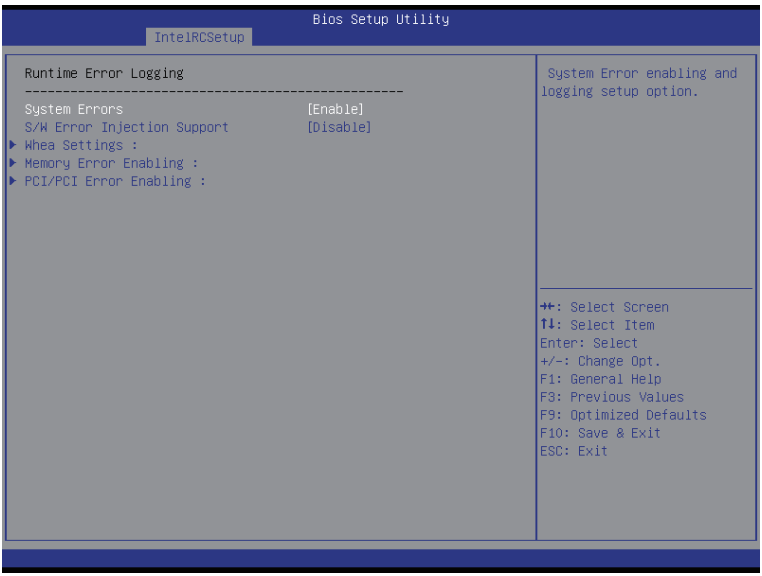
☞ **Error Code (for ME Firmware)**

Display ME Firmware status error code.

☞ **MCTP Bus Owner**

Configure MCTP Bus Owner.

2-3-10 Runtime Error Logging



☞ **Runtime Error Logging**

☞ **System Errors**

Enable/Disable system error logging function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **S/W Error Injection Support**

Enable/Disable software injection error logging function.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Whea Settings**

Press [Enter] for configuration of advanced items.

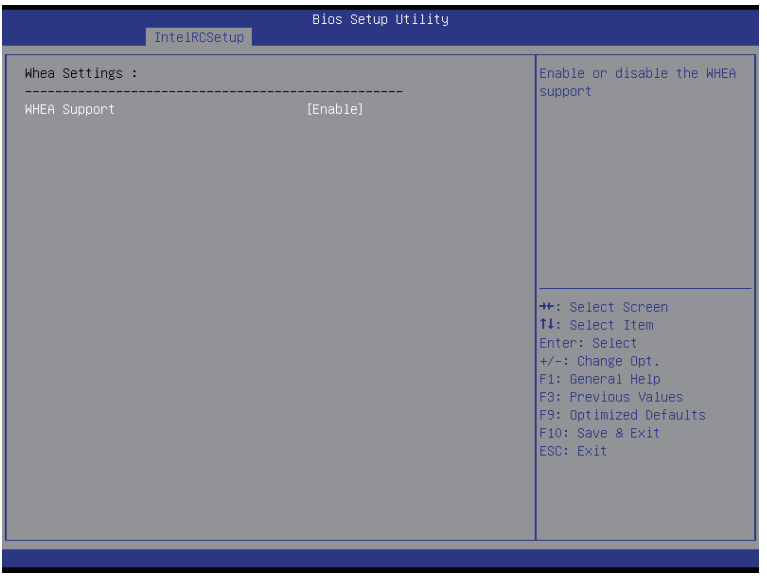
☞ **Memory Error Enabling**

Press [Enter] for configuration of advanced items.

☞ **PCI/PCI Error Enabling**

Press [Enter] for configuration of advanced items.

2-3-10-1 Whea Setting

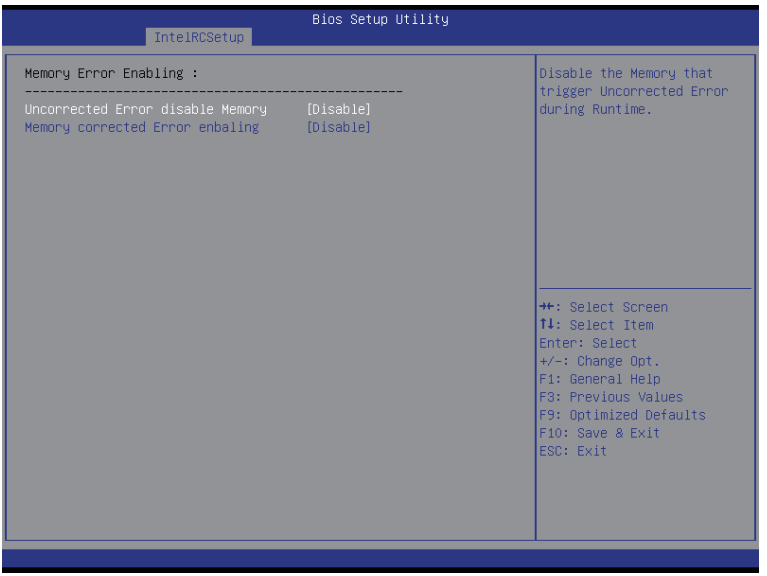


☞ **WHEA Support (Windows Hardware Error Architecture)**

Enable/Disable WHEA Support.

Options available: Enabled/Disabled. Default setting is **Enabled**.

2-3-10-2 Memory Error Enabling



☞ **Memory Error Enabling**

☞ **Un-Correctable Errors disable Memory**

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Memory corrected Errors enabling**

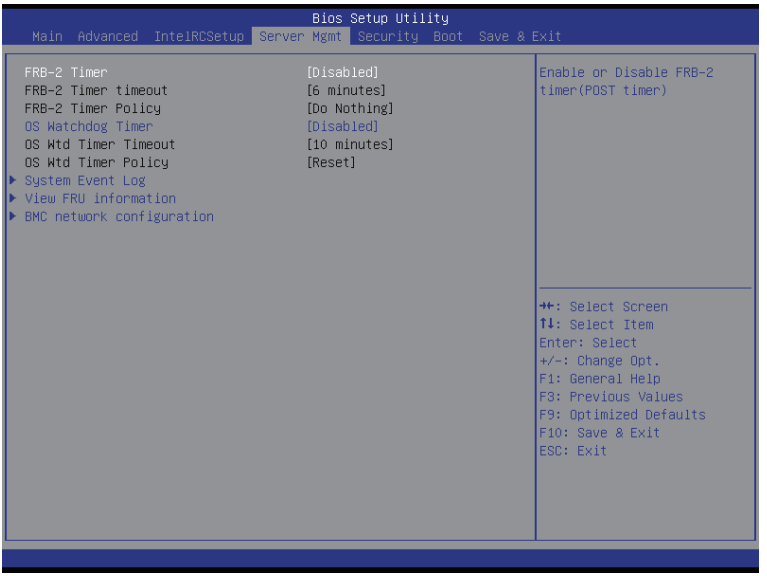
Options available: Enabled/Disabled. Default setting is **Disabled**.

2-3-10-3 PCI/PCI Error Enabling

☞ **PCI-Ex Error Enable**

Options available: Yes/No. Default setting is **Yes**.

2-4 Server Management Menu



☞ FRB-2 Timer

Enable/Disable FRB-2 timer (POST timer).

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ FRB2 Timer timeout

Configure the FRB2 Timer timeout.

Options available: 3 minutes/4 minutes/5 minutes/6 minutes. Default setting is **6 minutes**.

Please note that this item is configurable when FRB-2 Timer is set to Enabled.

☞ FRB2 Timer Policy

Configure the FRB2 Timer policy.

Options available: Do Nothing/Reset/Power Down. Default setting is **Do Nothing**.

Please note that this item is configurable when FRB-2 Timer is set to Enabled.

☞ OS Watchdog Timer

Enable/Disable OS Watchdog Timer function.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ OS Wtd Timer Timeout

Configure OS Watchdog Timer.

Options available: 5 minutes/10 minutes/15 minutes/20 minutes. Default setting is **10 minutes**.

Please note that this item is configurable when OS Watchdog Timer is set to Enabled.

☞ OS Wtd Timer Policy

Configure OS Watchdog Timer Policy.

Options available: Reset/Do Nothing/Power Down. Default setting is **Reset**.

Please note that this item is configurable when OS Watchdog Timer is set to Enabled.

☞ **System Event Log**

Press [Enter] for configuration of advanced items.

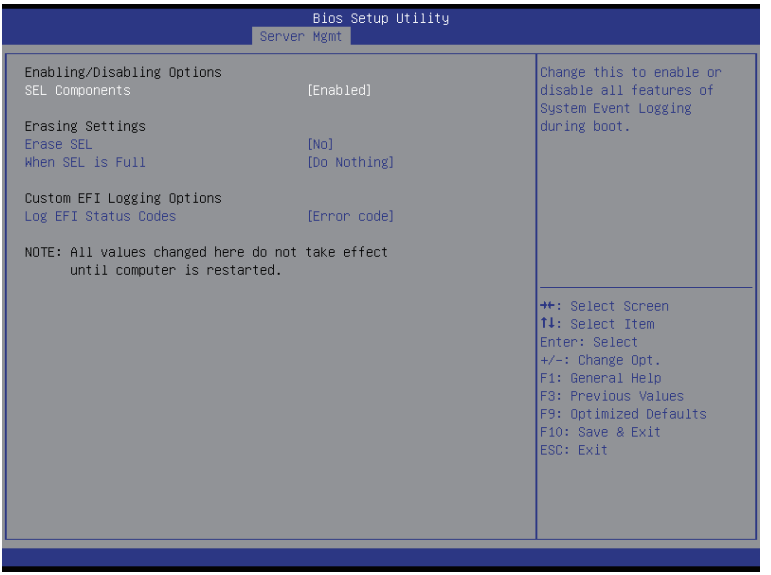
☞ **View FRU Information**

Press [Enter] to view the advanced items.

☞ **BMC network configuration**

Press [Enter] for configuration of advanced items.

2-4-1 System Event Log



☞ **Enabling/Disabling Options**

☞ **SEL Components**

Change this to enable or disable all features of System Event Logging during boot.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Erasing Settings**

☞ **Erasing SEL**

Choose options for erasing SEL.

Options available: No/Yes, On next reset/Yes, On every reset. Default setting is **No**.

☞ **When SEL is Full**

Choose options for reactions to a full SEL.

Options available: Do Nothing/Erase Immediately. Default setting is **Do Nothing**.

☞ **Custom EFI Logging Options**

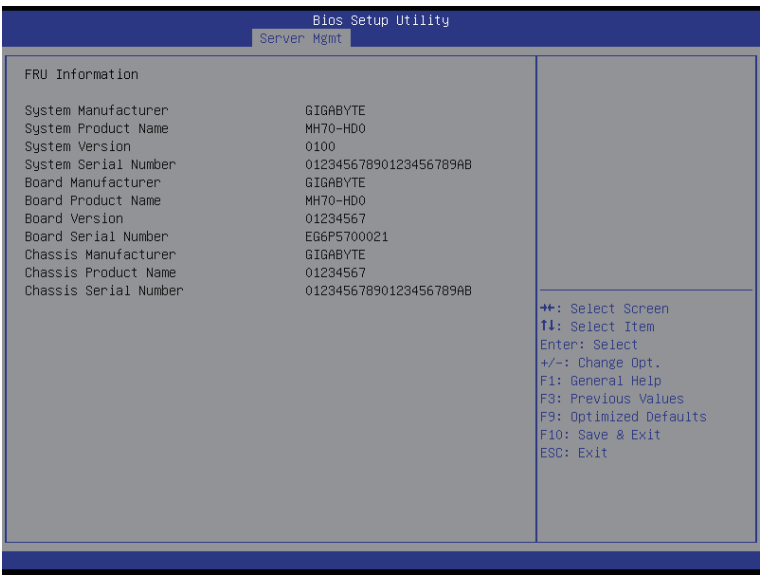
☞ **Log EFI Status Codes**

Enable/Disable the logging of EFI Status Codes (if not already converted to legacy).

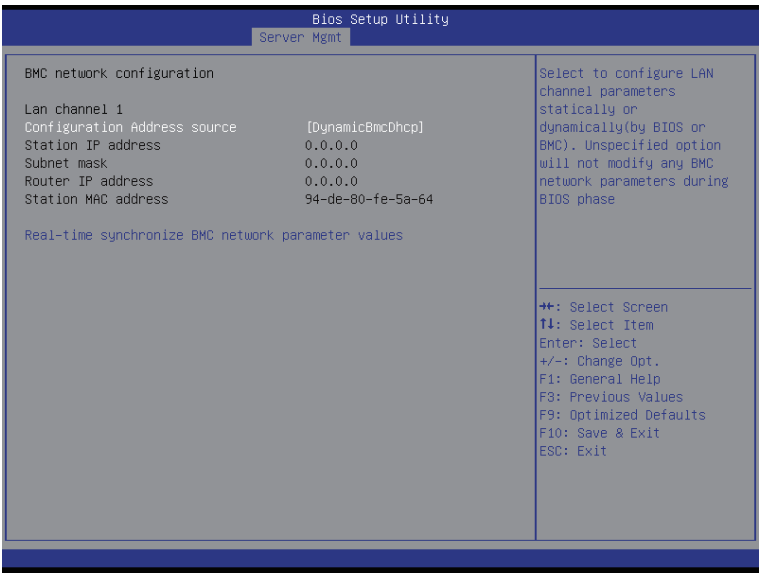
Options available: Disabled/Both/Error code/Progress code. Default setting is **Error code**.

2-4-2 View FRU Information

The FRU page is a simple display page for basic system ID information, as well as System product information. Items on this window are non-configurable.



2-4-3 BMC network configuration



☞ **BMC network configuration**

☞ **Lan Channel 1**

☞ **Configuration Address source**

Select to configure LAN channel parameters statically or dynamically (DHCP). Do nothing option willnot modify any BMC network parameters during BIOS phase.

Options available: Unspecified/Static/DynamicBmcDhcp. Default setting is **DynamicBmcDhcp**.

☞ **Station IP Address**

Display IP Address information.

☞ **Subnet mask**

Display Subnet Mask information.

Please note that the IP address must be in three digitals, for example, 192.168.000.001.

☞ **Router IP address**

Display the Router IP Address information.

☞ **Station MAC Address**

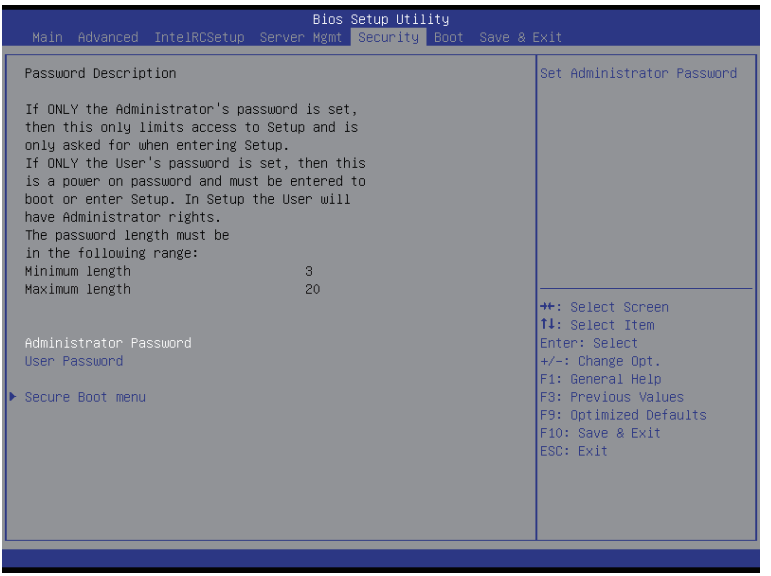
Display the MAC Address information.

☞ **Real-time synchronize BMC network parameter values**

Press [Enter] to synchronize BMC network parameter values.

2-5 Security Menu

The Security menu allows you to safeguard and protect the system from unauthorized use by setting up access passwords.



☞ **Administrator Password**

Press Enter to configure the Administrator password.

☞ **User Password**

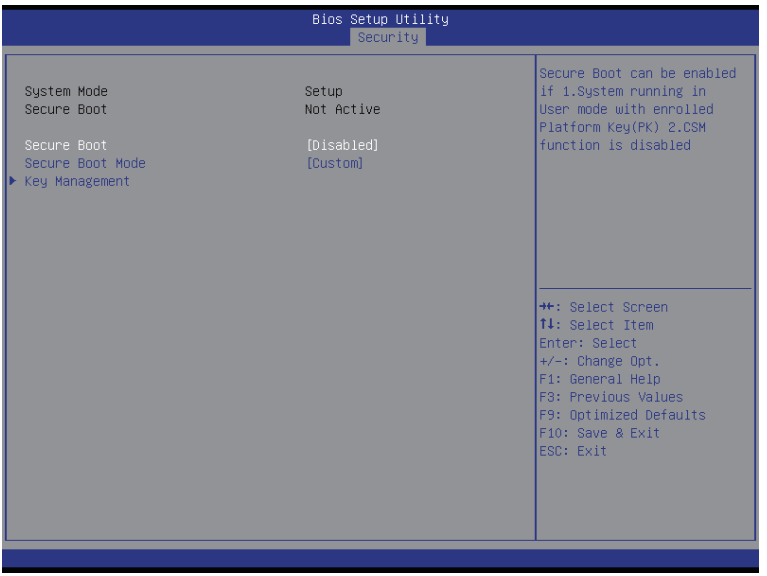
Press Enter to configure the user password.

☞ **Secure Boot menu**

Press [Enter] for configuration of advanced items.

2-5-1 Secure Boot menu

The Secure Boot Menu is applicable when your device is installed the Windows® 8 operatin system.



☞ **Secure Mode**

Display the System secure mode state.

☞ **Secure Boot**

Display the status of Secure Boot.

☞ **Secure Boot**

Enable/Disable Secure Boot function.

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ **Secure Boot Mode**

Secure Boot requires all the applications that are running during the booting process to be pre-signed with valid digital certificates. This way, the system knows all the files being loaded before Windows 8 loads and gets to the login screen have not been tampered with.

When set to Standard, it will automatically load the Secure Boot keys form the BIOS databases.

When set to Custom, you can customize the Secure Boot settings and manually load its keys from the BIOS database.

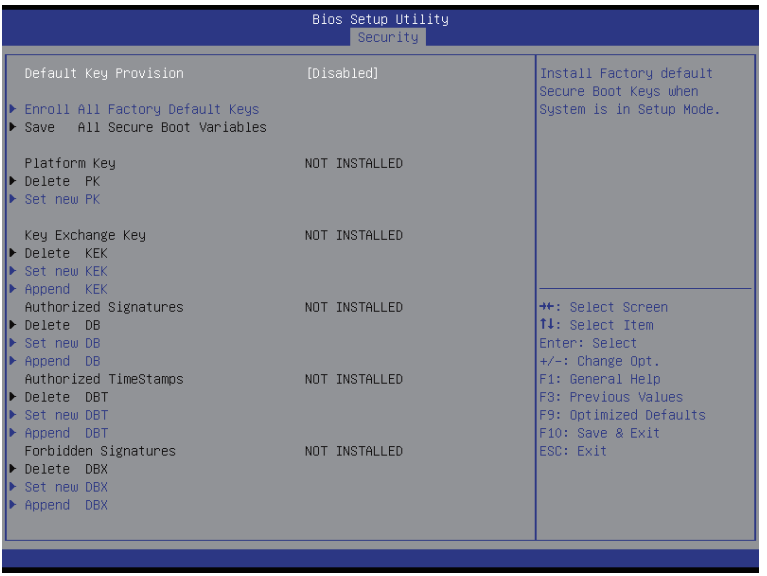
Options available: Standard/Custom. Default setting is **Standard**.

☞ **Key Management**[(Note)]

Press [Enter] for configuration of advanced items.

(Note) Advanced items prompt when this item is set to **Cutom**.

2-5-1-1 Key Management



☞ Default Key Provisioning

Force the system to Setup Mode. This will clear all Secure Boot Variables such as Platform Key (PK), Key-exchange Key (KEK), Authorized Signature Database (db), and Forbidden Signaures Database (dbx).

Options available: Enabled/Disabled. Default setting is **Disabled**.

☞ Enroll All Factory Default Keys

Press [Enter] to install all factory default keys.

☞ Save All Secure Boot Variables

Press [Enter] to save all Secure Boot Variables.

☞ Platform Key (PK)

Display the status of Platform Key.

☞ Delete the PK

Press [Enter] to delete the existed PK. Once the PK is deleted, all the system's Secure Boot keys will not be activated.

☞ Set new PK File

Press [Enter] to configure a new PK.

☞ Key Exchange Key Database (KEK)

Display the status of Platform Key.

☞ Delete KEK

Press [Enter] to delete the KEK from your system.

☞ Set new KEK

Press [Enter] to configure a new KEK.

☞ **Append Var to KEK**

Press [Enter] to load additional KEK from a storage devices for an additional db and dbx management.

☞ **Authorized Signature Database (DB)**

Display the status of Authorized Signature Database.

☞ **Delete DB**

Press [Enter] to delete the db from your system.

☞ **Set new DB**

Press [Enter] to configure a new db.

☞ **Append aVar to DB**

Press [Enter] to load additional db from a storage devices.

☞ **Forbidden Signature Database (DBX)**

Display the status of Forbidden Signature Database.

☞ **Delete the DBX**

Press [Enter] to delete the dbx from your system.

☞ **Set DBX from File**

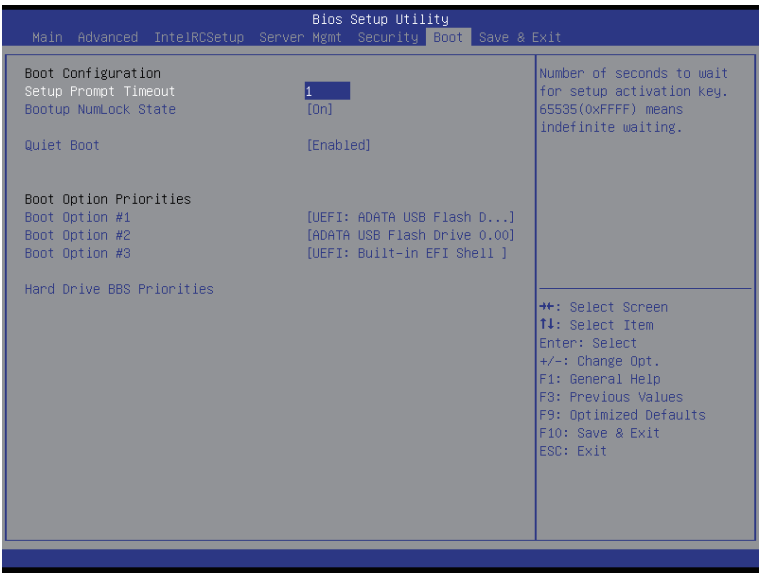
Press [Enter] to configure a new dbx.

☞ **Append Var to DBX**

Press [Enter] to load additional db from a storage devices.

2-6 Boot Menu

The Boot menu allows you to set the drive priority during system boot-up. BIOS setup will display an error message if the legacy drive(s) specified is not bootable.



☞ **Boot Configuration**

☞ **Setup Prompt Timeout**

Number of seconds to wait for setup activation key. 65535(0xFFFF) means indefinite waiting."

Press the numberic keys to input the desired value.

☞ **Bootup NumLock State**

Enable or Disable Bootup NumLock function.

Options available: On/Off. Default setting is **On**.

☞ **Quiet Boot**

Enables or disables showing the logo during POST.

Options available: Enabled/Disabled. Default setting is **Enabled**.

☞ **Boot Option Priorities**

☞ **Boot Option #1/#2/#3#4**

Press Enter to configure the boot priority.

By default, the server searches for boot devices in the following secquence:

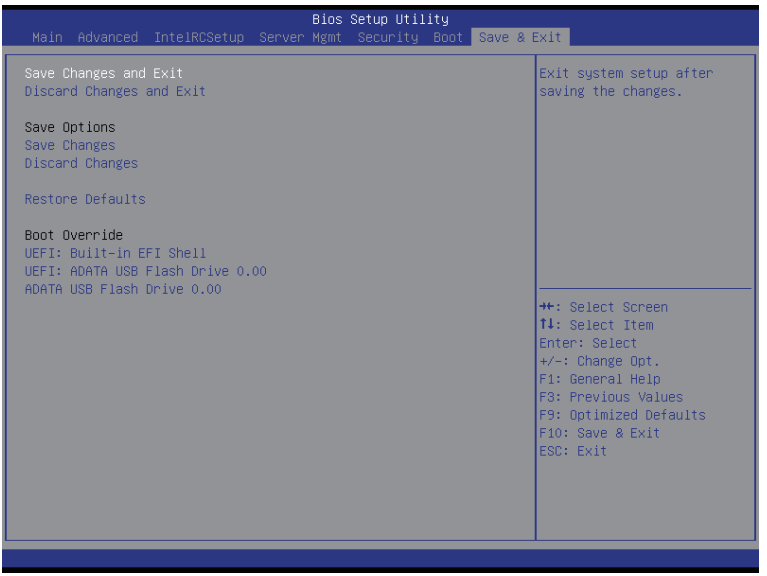
1. UEFI device.
2. Hard drive.
3. Network device.
4. USB device

☞ **Hard Drive BBS Priorities**

Press Enter to configure the boot priority.

2-7 Save & Exit Menu

The Exit menu displays the various options to quit from the BIOS setup. Highlight any of the exit options then press **Enter**.



☞ Save Changes and Exit

Saves changes made and close the BIOS setup.

Options available: Yes/No.

☞ Discard Changes and Exit

Discards changes made and exit the BIOS setup.

Options available: Yes/No.

☞ Save Options

☞ Save Changes

Saves changes made in the BIOS setup.

Options available: Yes/No.

☞ Discard Changes

Discards changes made and close the BIOS setup.

Options available: Yes/No.

☞ Restore Defaults

Loads the default settings for all BIOS setup parameters. Setup Defaults are quite demanding in terms of resources consumption. If you are using low-speed memory chips or other kinds of low-performance components and you choose to load these settings, the system might not function properly.

Options available: Yes/No.

☞ **Boot Override**

Press Enter to configure the device as the boot-up drive.

☞ **UEFI: Built-in in EFI Shell**

Press <Enter> on this item to Launch EFI Shell from filesystem device.

2-8 BIOS Beep Codes

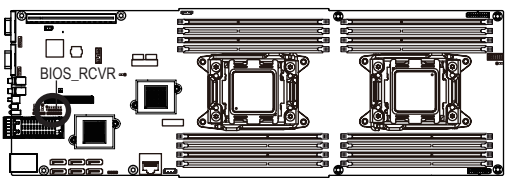
# of Beeps	Description
5	Memory error during POST.

2-9 BIOS Recovery Instruction

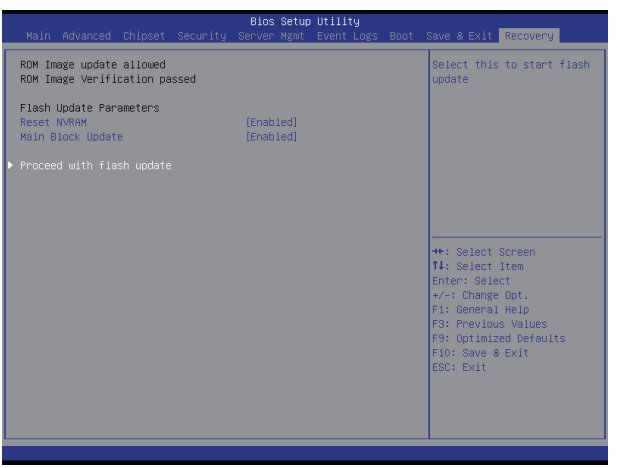
The system has an embedded recovery technique. In the event that the BIOS becomes corrupt the boot block can be used to restore the BIOS to a working state. To restore your BIOS, please follow the instructions listed below:

Recovery Instruction:

1. Change xxx.ROM to amiboot.rom.
2. Copy amiboot.rom and AFUDOS.exe to USB diskette.
3. Setting BIOS Recovery jump to enabled status.



4. Boot into BIOS recovery.
5. Run Proceed with flash update.
6. BIOS update.



Chapter 3 Appendix

3-1 Regulatory Statements

Regulatory Notices

This document must not be copied without our written permission, and the contents there of must not be imparted to a third party nor be used for any unauthorized purpose. Contravention will be prosecuted. We believe that the information contained herein was accurate in all respects at the time of printing. GIGABYTE cannot, however, assume any responsibility for errors or omissions in this text. Also note that the information in this document is subject to change without notice and should not be construed as a commitment by GIGABYTE.

Our Commitment to Preserving the Environment

In addition to high-efficiency performance, all GIGABYTE motherboards fulfill European Union regulations for RoHS (Restriction of Certain Hazardous Substances in Electrical and Electronic Equipment) and WEEE (Waste Electrical and Electronic Equipment) environmental directives, as well as most major worldwide safety requirements. To prevent releases of harmful substances into the environment and to maximize the use of our natural resources, GIGABYTE provides the following information on how you can responsibly recycle or reuse most of the materials in your "end of life" product.

Restriction of Hazardous Substances (RoHS) Directive Statement

GIGABYTE products have not intended to add and safe from hazardous substances (Cd, Pb, Hg, Cr+6, PBDE and PBB). The parts and components have been carefully selected to meet RoHS requirement. Moreover, we at GIGABYTE are continuing our efforts to develop products that do not use internationally banned toxic chemicals.

Waste Electrical & Electronic Equipment (WEEE) Directive Statement

GIGABYTE will fulfill the national laws as interpreted from the 2002/96/EC WEEE (Waste Electrical and Electronic Equipment) directive. The WEEE Directive specifies the treatment, collection, recycling and disposal of electric and electronic devices and their components. Under the Directive, used equipment must be marked, collected separately, and disposed of properly.

WEEE Symbol Statement

The symbol shown below is on the product or on its packaging, which indicates that this product must not be disposed of with other waste. Instead, the device should be taken to the waste collection centers for activation of the treatment, collection, recycling and disposal procedure. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or where you purchased the product for details of environmentally safe recycling.

- When your electrical or electronic equipment is no longer useful to you, "take it back" to your local or regional waste collection administration for recycling.
- If you need further assistance in recycling, reusing in your "end of life" product, you may contact us at the Customer Care number listed in your product's user's manual and we will be glad to help you with your effort.

Finally, we suggest that you practice other environmentally friendly actions by understanding and using the energy-saving features of this product (where applicable), recycling the inner and outer packaging (including shipping containers) this product was delivered in, and by disposing of or recycling used batteries properly. With your help, we can reduce the amount of natural resources needed to produce electrical and electronic equipment, minimize the use of landfills for the disposal of "end of life" products, and generally improve our quality of life by ensuring that potentially hazardous substances are not released into the environment and are disposed of properly.